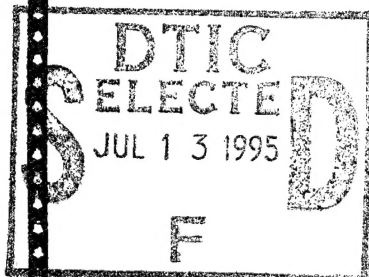


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PERSONAL EXPERIENCE MONOGRAPH



THROUGH THE EYE OF THE DRAGON A HISTORY OF THE 3RD BATTALION, 82ND FIELD ARTILLERY IN THE PERSIAN GULF WAR

BY

LIEUTENANT COLONEL KENNETH R. KNIGHT
United States Army

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A PERSONAL MONOGRAPH

BY

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ARMY WAR COLLEGE
CARLISLE BARRACKS, PENNSYLVANIA

MAY, 1992

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PREFACE

This is the story of an artillery battalion at war. In this account I have tried to recreate the events that occurred from pre-deployment through the return of the battalion from the theater.

The paper is written as a history and therefore, I have attempted to leave most of the emotionalism and feeling out of the account. Perhaps the story is incomplete because of this omission. There are many, many vignettes and stories of patriotism, hardship and sacrifice that are not included. There are precious, humorous stories that so vividly add to the GI's folklore and legend.

If told, they would describe a group of unique individuals who came together as a team and who built everyday on their pride, esprit and professionalism. They would tell about the many times that privates, specialists and young buck sergeants performed on their own, with no supervision, and gave their all because they were patriots, great Americans, the best soldiers this country has ever fielded. Someday, in another document, I hope to tell this story.

I relied on two primary sources for this paper. The first was an after action report written by Captain Todd Lietha, the battalion fire direction officer, a few days after the cease fire. The second reference was a journal that I maintained throughout Operations Desert Shield/Storm. There are some

discrepancies between the two. In those instances I used my daily journal as the primary source. All of the maps, with three exceptions, were taken from Captain Lietha's document. Maps 19, 20 and 23 are from Triumph Without Victory, written after the war by the editors of "U.S. News and World Report."

Both references are on file at the Military History Institute (MHI) at Carlisle Barracks, Pennsylvania. The MHI also has 190 photographs and video footage of the battalion that was taken during the war. The 1st Cavalry Division Museum, Ft. Hood, Texas, has also been provided a copy of the photos, videos and Captain Lietha's report, but not my personal journal.

This paper was written at the Army War College under a time constraint and, therefore, was not staffed or previewed by anyone else from the battalion. Undoubtedly there are mistakes but it is as accurate as my records and memory serve.

THROUGH THE EYE OF THE DRAGON

A HISTORY OF THE 3RD BATTALION, 82ND FIELD ARTILLERY IN THE PERSIAN GULF WAR

A prince should therefore have no other aim or thoughts, nor take up any other thing for his study, but war and its organization and discipline, for that is the only act that is necessary to one who commands.

Machiavelli

INTRODUCTION

War! My generation grew up in the Army hearing our Elders, the Veterans (the captains and the majors), tell about Vietnam and how war really was. We saw and lived through the after effects of Vietnam - the drugs and the racial problems, the draft army, then VOLAR (Volunteer Army) and poor popular support. For years my generation and our Elders worked to turn this around. We studied and trained hard. We redefined leadership and tactics. We worked training into an art, culminating our efforts with the combat training centers. We asked for and received the very best men and women America had to offer, and we turned them into soldiers. We read and studied the art of war and prepared for combat with the Russian Bear. We wondered how it would be, this phenomenon called war. And while we were as well prepared for it as any army that ever went to war, we had only our

background in reading, our training, and the knowledge of our Elders to prepare us for the next clash of arms.

Then, without warning, it came. The Persian Gulf War was not the conflict we expected, but it was an astounding validation of almost twenty years of training and preparation for war.

Shortly after the war ended, General Norman Schwarzkopf stated in an interview:

I will tell you, the young lieutenant colonels out there who are commanding now today are ten times better than I was as a battalion commander in their level of professionalism. It's a life thing with them. And they study it and they work it and they talk about it actively and that's very healthy.

This paper is written as seen through my eyes as the battalion commander of 3rd Battalion, 82nd Field Artillery (Red Dragons), 1st Cavalry Division during Operations Desert Shield and Desert Storm. The period covered is from pre-deployment on 10 August 1990 through re-deployment 20 April 1991.

PRE-DEPLOYMENT, 10 AUGUST - 10 OCTOBER 1990.

When I went to work on 10 August 1990 the headline news story was the week old Iraqi invasion of Kuwait. My thoughts that morning were on training and an upcoming rotation to the National Training Center (NTC). My last thought was on war, especially in the Middle East. If there was a conflict, my Division's mission was to reinforce Europe in a major war. You simply did not deploy heavy armored divisions overseas unless

there was a major war and that did not seem likely, even in the Middle East.

By 1400 that afternoon I had learned how quickly things can change. The Division had been alerted to deploy as part of the XVIII Airborne Corps with the mission of the defense of the Kingdom of Saudia Arabia. Thus began one of the most intense eight weeks of my life.

My initial assessment of the battalion was good. The Red Dragons had been to the NTC in December, 1989 and the Tactical Operations Center (TOC) had just returned in June, 1990. The core of the battalion had been together for over a year and the leadership positions, both officer and NCO, were filled with quality, experienced people. Even though our last battalion collective training had been over four months before, in March, I felt the battalion was still well trained.

We had three weaknesses that concerned me. The first was our ability to deploy. During the first year, the battalion had reported itself as a "P" (needs practice) under its' METL¹ task of Deployment. Little training had been done in this area with the exception of our annual training exercise to the NTC at Ft. Irwin, California. We had been working hard in anticipation of an unannounced EDRE² inspection and this preparation helped considerably. Our justification for this lack of training was

¹Mission Essential Task List, an evaluation instrument used by the commander to evaluate the readiness condition of the unit.

²Early Deployment Readiness Exercise, an inspection conducted by a higher headquarters, in this case, U.S. Forces Command.

that our reinforcing mission of Europe included the provision that we would only deploy troops to Europe and they would fall in on POMCUS³ equipment.

Secondly, I was concerned about our equipment. It was well used, especially from numerous intensive training exercises in the harsh environment of Ft. Irwin. Our 2½ ton truck fleet was in poor shape with many of the vehicles older than the young soldiers who drove them. Our 1.5 and 4.2 KW generators were also old and worn out. Not being able to draw new equipment for war from POMCUS stocks as planned had a very sobering effect.

And finally, I was concerned about the new soldiers who would join the battalion before we left and who would be virtually untrained in collective skills before we deployed. On 10 August the battalion strength was at about 91% strength. We would deploy in October at over 100% (a total of 700 soldiers). Our shortages were primarily in our fire support teams (FIST) - critical in my view for two reasons. First, FIST teams are difficult to train. Not only do they need to be proficient in their artillery skills, but they need experience to execute those skills properly. They also must integrate themselves fully into the infantry and armor companies that they support. Secondly, the FIST are located on the most exposed and dangerous part of the battlefield - not a good place for new, untrained soldiers.

³Prepositioned Material Configured to Unit Sets, army equipment stored in Europe in division sets. POMCUS is maintained for some CONUS based divisions who fly their troops to Europe during a conflict and draw this equipment rather than shipping their own.

I expected heavy losses in the FIST if we went straight into a fight. Additionally, the success or failure of the FIST would have a direct impact on the infantry and armor units that they supported. We were able to off-set some of the inexperience problem by assigning three ex-battery commanders (Captains Bell, Gallagher and Woods) to the three task force fire support officer positions. The experience that these three officers brought to the FIST was invaluable with a visible payoff during combat operations.

The method of deployment for the 1st Cavalry Division was a four phase operation: Phase 1 - Preparation Phase lasting 3-4 weeks; Phase 2 - Shipment of Equipment Phase, 2-3 weeks; Phase 3 - Individual Training/Certification and Phase 4 - Air Movement of Personnel. Each phase had some overlap.

During Phase 1, the Division mission was to prepare equipment for shipment, achieve -10/-20 standards⁴ for all vehicles and to repaint the entire fleet from OD green to desert sand. The Division went on a seven day work schedule with many work days averaging 12-14 hours. Parts and equipment began to flow into Ft. Hood at an unprecedented rate.

The Division's goal was to deploy with every soldier having two sets of Desert Battle Dress Uniforms (DBDU). Our two biggest

⁴-10/-20 standards refer to the technical manuals associated with a piece of equipment. In order for a piece of equipment to be in -10/-20 condition it must be operational, have no safety deficiencies, have all other noted deficiencies fixed or parts on order.

problems during Phase 1 centered around the DBDUs and painting of vehicles - mainly due to availability and quantity of resources.

A week after being alerted, the Division Artillery (DIVARTY) was able to conduct a two day, live-fire field training exercise (FTX). The DIVARTY was the only brigade at Ft. Hood that was able to do any large scale collective training, mainly due to its high level of maintenance of equipment. During this FTX the 3/82 FA fired copperhead⁵ for the first time with very successful results.

Phase 2 began in late August as the Division began shipping hundreds of vehicles per day to the port of Houston. Tracked vehicles were uploaded with ammunition and shipped by rail to the port. Wheeled vehicles, after undergoing rigorous safety technical inspections, were driven in convoy. The strong support of the American public for the operation was very evident by the turnout of civilians on the convoy route.

The Division deployment order was DISCOM (Division Support Command), 1st Brigade, Tiger Brigade⁶, DIVARTY and 2nd Brigade. The Division deployed organized in brigade battle task force configuration, therefore, 3/82 FA shipped with 2nd Brigade as its direct support artillery battalion. We were one of the last units to depart Ft. Hood, a point of some interest to be

⁵Laser guided 155mm munition. Can be guided onto target by a laser from a FIST team or an aerial platform equipped with a laser range finder.

⁶Tiger Brigade - attached to the 1st Cavalry Division from the inactivating 2nd Armored Division, also located at Ft. Hood.

addressed later in this paper.

Phase 3, Individual Training and Certification actually started during the first few days after the alert order and ended just prior to deployment. Training centered around individual skills, with heavy emphasis on weapons firing, NBC training and first aid.

Phase 4, Deployment of Personnel, began in early September and ended in mid-October. Due to a quirk in scheduling we were tasked to send 90 soldiers three weeks ahead of the rest of the battalion. I sent our fire support section led by the brigade fire support officer, Major Mike Barron. This section was selected to go first since the maneuver units they supported and were attached to would be arriving before the 3/82 FA. I also included a small logistics cell in the first group with the hope that they would be able to establish a base for the main body when it arrived. The remainder of the battalion departed Ft. Hood in two large groups on 8 and 10 October. The XO, Major Gerry Snelson, and CSM Gordon Tolleson went with the 8 October group. The S-3, Major Fred Johnson, and I accompanied the last group of 350 soldiers. The Division philosophy on deployment, and thus the battalion philosophy, was to send in logistics personnel in the first loads in order to establish a support base for those following. Operators and combat troops went in last.

On 23 September, on the eve of deployment, the members of the mess (the officers, command sergeant major and the first sergeants) presented a silver punchbowl with cups to the

battalion. The presentation was made at a punchbowl ceremony held at the West Fort Hood Officer's Club. BG Tilelli, 1st Cavalry Division Commander, and Colonel Gass, DIVARTY Commander, were honored guests. Each member of the mess and his lady participated in the ceremony.

KEY POINTS/PRE-DEPLOYMENT LESSONS LEARNED.

1. Sets, kits and outfits such as field sanitation, carpenters and barber kits, etc. are often poorly maintained during peacetime or have shortages. When the time came to deploy, even with three or four weeks preparation before equipment was shipped, we were not able to overcome all the shortages. These shortages impacted on the quality of life during Desert Shield.

2. The battalion family support group is an important morale booster for both the unit and the family. The success of the program is directly related to how well it was established during peacetime and the involvement and support of all the commanders. Within 24 hours of our alert order, we brought in key leaders of the family support group to brief them on the situation. A DIVARTY level and a battalion level information session was held with all our families before we left.

3. Prescribed Load Lists (PLL) need to be maintained at 95% levels or higher. Parts availability during the first three months of deployment were very inadequate. We survived almost entirely on the PLL that we took with us. This included all

areas - maintenance, NBC (nuclear, biological and chemical), small arms, medical, etc.

4. Pre-deployment is a very stressful, uncertain period. The "truth" changes every day. Soldiers and families must understand this and be kept informed as much as possible about current information and changes.

OPERATION DESERT SHIELD

THE PORT - 11 October - 22 October 1990

My flight, with 350 Red Dragons on board, arrived at the airport at Daharan, Saudia Arabia at 1400 on 11 October after a 22 hour flight. The temperature was 100 degrees with 50% humidity. We were greeted by half of the 1st Cavalry Division band (the other half serenaded us when we left Ft. Hood) and were issued our first bottled water. A 40 minute bus ride took us to the port at Dammam where we were reunited with the rest of the battalion.

Living conditions were appalling. The 3/82 FA was located on a long wharf over a mile long. Several thousand soldiers were housed here in warehouses. We had 580 soldiers from the battalion sharing an open warehouse with 200 soldiers from a maintenance battalion. Included in this 200 were at least 20 females who had no privacy from their 700 plus male room mates. The remaining 120 Red Dragons were located in an adjacent warehouse. Soldiers were issued metal cots spaced three feet apart. Portable latrines were located 400 meters away and portable showers were over one-half mile away. Sanitary conditions were terrible and no laundry facilities were available. The Saudis were responsible for keeping things clean but did a poor job. Hot T-rations were served for breakfast and dinner. Lunch was MREs.⁷ Making matters even worse, ships were unloading at the wharf 24

⁷MRE, Meals Ready To Eat.

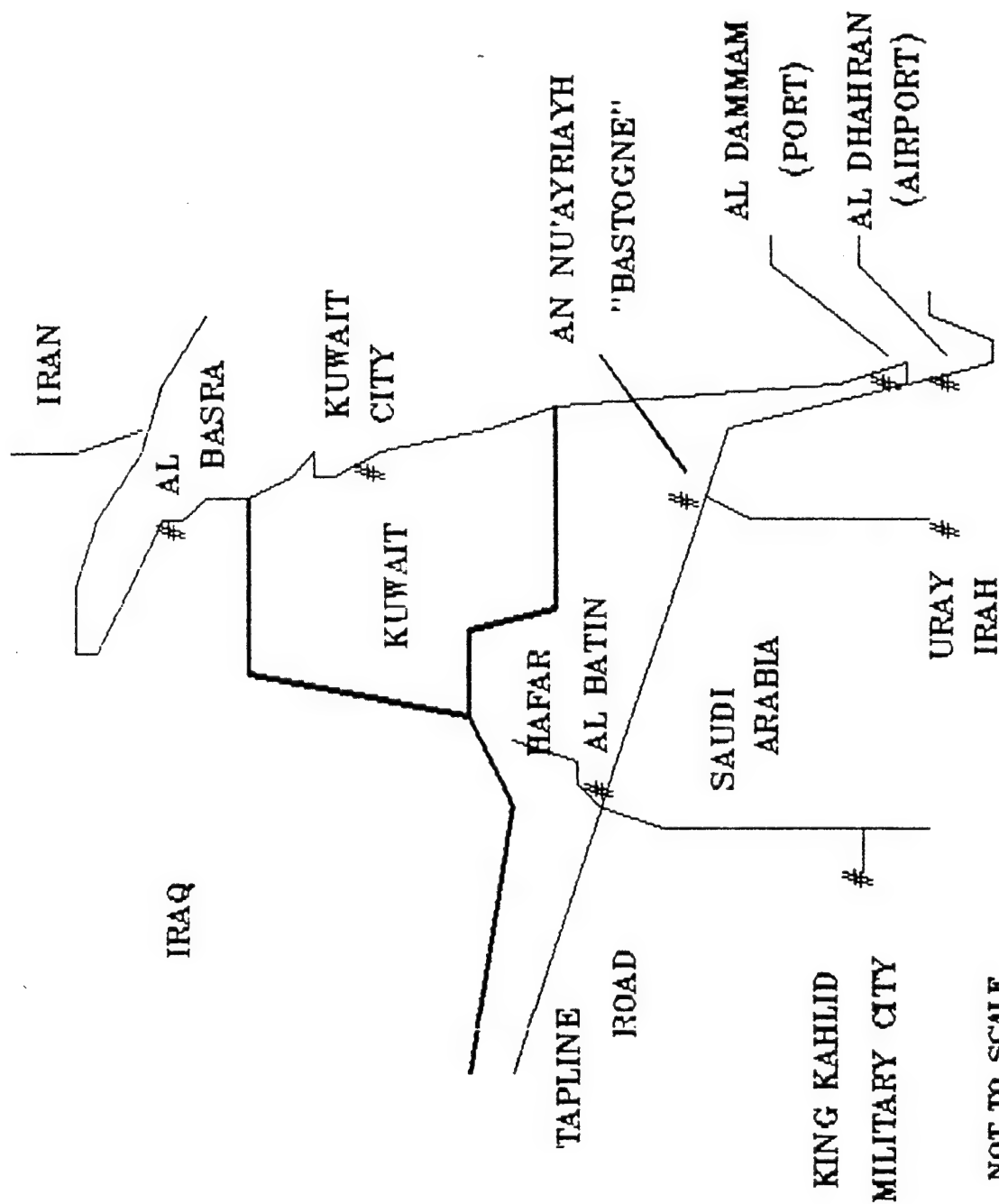
hours a day so between the heat, noise and lights, sleep was almost impossible.

There was no escape from this miserable place. The battalion had one HMMWV⁸ which had been flown over. Other than that, there was no transportation. The small Saudi PX located at the port was not within walking distance. Soldiers had absolutely nothing to do - a terrible condition in which to try to maintain morale or a fighting edge. There appeared to be little effort made by the Saudis to improve conditions. A good example of this was the phone situation. The few phones booths available at the port were disconnected because the continual use by the soldiers was overloading Saudi overseas lines. Operational phones would have been significant to improving soldier morale but there appeared to be little concern on the part of our hosts to fix the problem. Adequate shower and latrine facilities also could have made conditions much better. Since soldiers were using portable facilities, the addition of more would have solved the problem.

For the past year the 3/82 FA had enjoyed great success in meeting every challenge it was faced with. Morale and pride in unit was extremely high. The true mettle of the battalion surfaced quickly in this situation. The battalion assumed responsibility for its' share of portable latrines and posted guards to ensure that soldiers cleaned after themselves. Military order was established in the warehouse, with rules and standards set. Wood was collected from the wharf and picnic

⁸High-Mobility Multipurpose Wheeled Vehicle.

REGIONAL MAP OF SOUTHWEST ASIA



NOT TO SCALE

tables constructed and clothes lines erected. I dispatched the adjutant, and he was able to scrounge a 16mm projector and movies to show in the warehouse in the evenings. A PT program was established.

Even though quality of life improved, conditions were still poor. The battalion command group was very concerned about morale and the health of the battalion. We quickly decided that we had to get the battalion out of the port and into the desert as quickly as possible. Battalions were scheduled to close into Saudia Arabia within three to four days of arrival of their equipment. In our case, this proved to be true. Our ship, the SAUDI ABA, arrived on the evening of 14 October with 98% of our equipment. We had her unloaded in less than 24 hours - a remarkable feat.

As soon as we had our HMMWVs unloaded, the XO, S-3 and I headed for the desert on a day long recon of the 1st Cavalry Division's assigned position in TAA⁹ Horse, 100 miles north west of Damman. We met the 2nd Brigade Commander who gave us a 4 x 5 km area to look at for the battalion. The terrain was sandy with small hills and sand dunes. The area was almost devoid of any plant life but the presence of occasional camel herds and Bedouin tribes indicated some life sustainability. Our area was located six miles off a paved road and 20 miles north of the main highway connecting Dhahran and Riyadh. There was a small village named Uray Irah located on the paved road, 15 - 20 miles away.

⁹Tactical Assembly Area.

Otherwise, there were no other settlements between our position and the port.

A word about command relationships. As the direct support artillery battalion for the 2nd Brigade, my battalion was part of that Brigade Battle Task Force.¹⁰ The brigade commander, Colonel Randy House, was responsible for my logistical support and integration into the brigade team. The division artillery commander, Colonel Jim Gass, was responsible for the technical aspects of artillery and collective training, and he was still my rater. In effect, I had two bosses. Fortunately, both were true professionals and outstanding leaders so there was very little controversy over this arrangement.

The brigade commander was a true study in leadership. As soon as he could collect enough vehicles¹¹, the brigade commander left the port and set up operations in the desert, leaving details in Damman to his XO. The brigade commander's philosophy was that if he went to the field early it would force battalion commanders to break with the port and get their commands into the field quickly. His concern over health and morale issues associated with the port matched mine. It worked. Even though the 2nd Brigade was the last to depart Ft. Hood, and the last to arrive in country, it was the first brigade in the desert. 3/82 FA was

¹⁰Brigade Battle Task Force, TF 1-5 (Mech heavy); TF 1-32 and TF 1-8 (both Armor heavy); 3-82 FA; 15 Forward Support Bn; B Co. 8th Engineers; divisional air defense, military intelligence, chemical company and signal assets.

¹¹Some wheeled vehicles and command tracks belonging to one of the brigade's battalions, Task Force 1-5.

the second battalion in the Division to deploy to the desert even though one of the last to depart the states. We noticed a strange phenomenon where units seemed to be reluctant to wean themselves from the "comfort zone" of the port, even though conditions were so bad. Once in the desert, quality of life improved significantly.

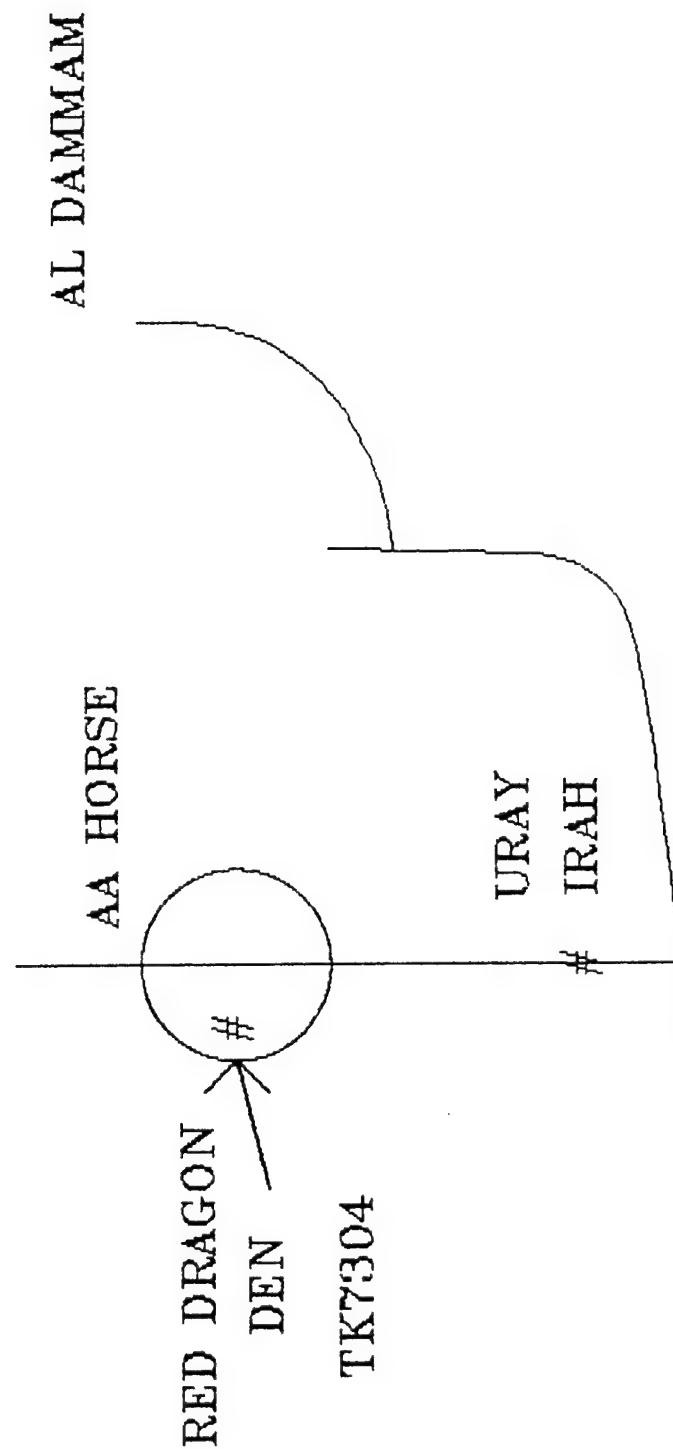
The battalion spent three days consolidating vehicles, drawing water, supplies, portable showers, latrines, etc. The port was a logistical nightmare. It was a matter of intimidation to get anything. We finally rolled out 90 wheeled vehicles¹² from the port on the morning of the 18th under the direction of the S-3. All made it to our desert location with no breakdowns. At 1830 on the same day I led 61 "low boys" (leased commercial tractor trailers) uploaded with our tracked vehicles.¹³ These vehicles were driven by a mixture of Pakistani, Thai, Korean, Filipino and Indian drivers. They had no leader or sense of organization and would stop to pray, eat, urinate, etc., whenever they felt like it. With the assistance of two Saudi military policemen assigned to the convoy and cajoling by the battalion leadership, we arrived intact at our down-load site at 2230.

The desert is unbelievably dark at night, with absolutely no light or reference points. At the down-load site we had our

¹²The battalion had 120 wheeled vehicles. Some accompanied the tracked convoy that went out later on the 18th. About 15 were located on another ship that arrived a few days later.

¹³The battalion had 80 tracked vehicles. The remaining 19 were transported to the field in two separate convoys over the next two days.

PORT OF AL DAMMAM TO AA HORSE



DATE: 23 OCT 90
TOTAL DISTANCE: 218 KM/135 MI

first lesson in operating under these conditions, as well as the sand. Although we unloaded with no problems, 50 of the 61 low boys became stuck in the sand. We spent several hours pulling these valuable division assets out of the sand and back onto the paved road, completing the operation at 0200.

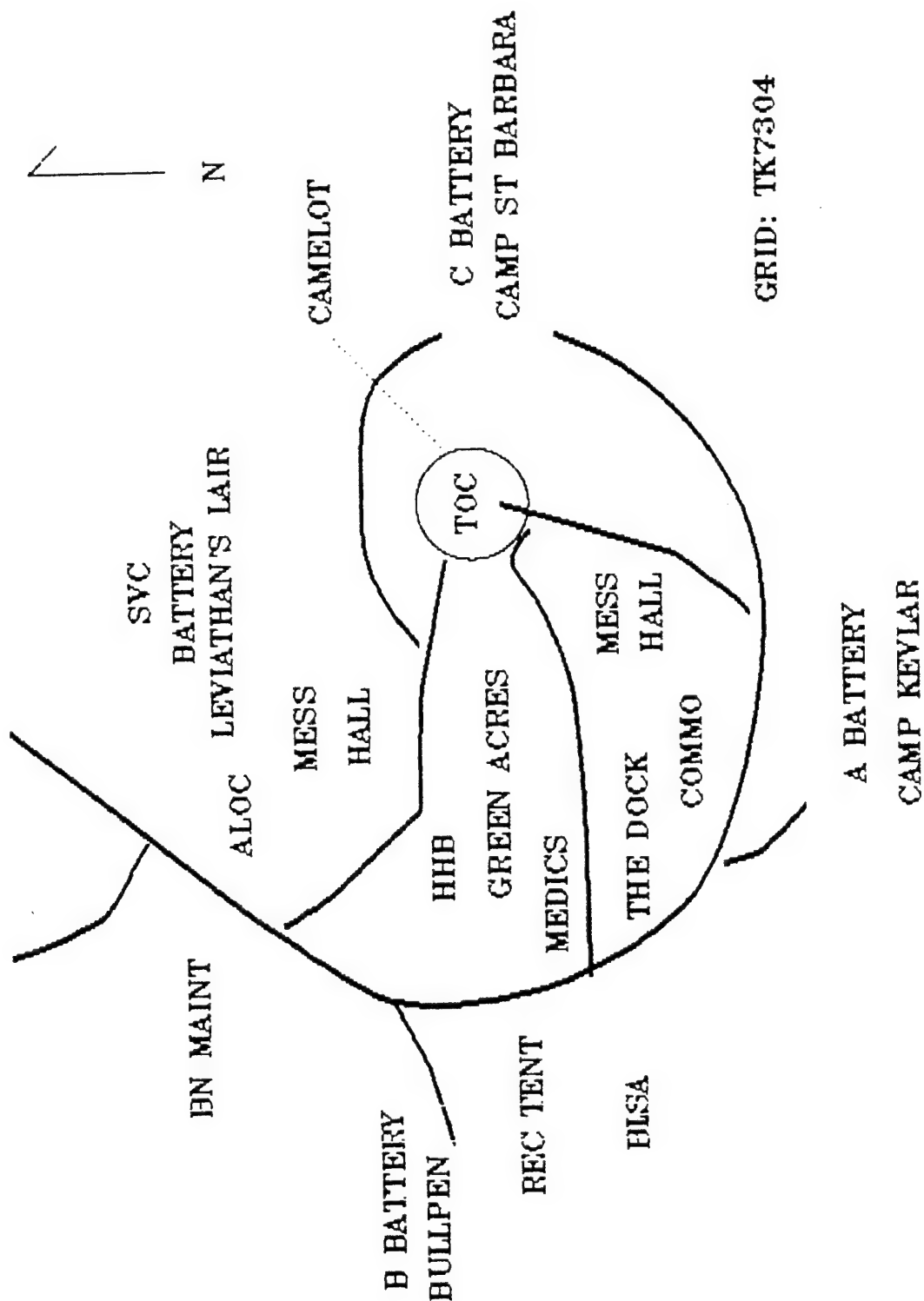
We moved the battalion into a Tactical Assembly Area (TAA) about two kilometers off the paved road and stayed there for three days until the rest of the battalion closed in from the port.

RED DRAGON DEN - 22 October - 4 January 1991

The 1st Cavalry Division's initial mission was the defense of Saudia Arabia as part of the XVIII Airborne Corps. We were the Corps reserve and positioned to counter-attack in the event of an Iraqi attack. Rather than occupy TAAs we were told to establish life support areas (LSA). Our primary threat would be from terrorists.

On 22 October we moved from our TAA to our LSA, six miles to the west. The LSA was a goose egg shaped circle $1\frac{1}{2}$ x 1 km in diameter. The three firing batteries occupied the perimeter and Headquarters Battery (HHB), Service Battery and the Tactical Operations Center (TOC) positioned in the center. The first week was used for establishing the LSA and camp routine. We were issued a large number of GP medium and GP large tents, but still not enough to put every soldier under canvas. The army tents were supplemented with leased Bedouin tents. These unique tents

RED DRAGON DEN



would sleep four and were made from cotton material and lined on the inside with a very colorful cloth. They served as wind and sun screens but did poorly in rain or sand storms. Scrounging tents was a continual battalion priority. Cots were also required for every soldier. This was a necessity because of scorpions and deadly snakes that were prevalent. We were issued enough cots at the port to meet our needs.

We named our LSA the Red Dragon Den. Each battery named their own area as follows: HHB - Green Acres; A - Camp Kevlar; B - Bravo Bullpen; C - Camp St. Barbara; Service - Leviathan's Lair; TOC area - Camelot.

Navigation in the desert became an immediate concern. There were few reference points and at night there were none. Navigation required a good compass, an accurate vehicle odometer and luck. At the port the battalion had been issued 20 LORANS.¹⁴ Most of these were issued to the FIST teams leaving only eight for the rest of the battalion. In addition the battalion had two survey vehicles equipped with PADS¹⁵ which could determine grid location and an Air Force Global Positioning device which initialized the PADS. Using these devices we laid out a sandbag

¹⁴A navigational device normally used by ships at sea. Loran is a international, world-wide system and relies on radio signals from stations situated on coastlines. In Saudia Arabia there were several stations due to the large coastline of the country. Loran became less accurate as the user went inland. Initial error in TAA Horse was 200-500 meters. In Iraq we experienced errors as great as 1 km. Loran gives location in latitude and longitude. Since the military uses military grid, this took additional training to learn conversion rules, etc.

¹⁵Position Azimuth Determination.

road from the LSA to various areas where supply trucks, water re-supply vehicles, etc., needed to go. These roads actually consisted of single sandbags, each placed within sight of the next. An occasional sandbag along the road was tagged with its grid location. Sandbags were visible during the day, and with the aid of night vision goggles, could be seen at night.

Even with these aids navigation was difficult. Vehicles that left the LSA were required to travel in pairs, have a radio and a minimum of two people in each vehicle. Vehicles were inspected for safety equipment and were required to have adequate food and water on board.

At the port we were issued wooden, portable latrines and showers that were constructed by Saudi contractors. GI ingenuity quickly improved them. For example, systems were devised to pump water into holding tanks and to heat it for hot showers. I authorized trucks to return to the port every week to scrounge wood, sand bags, etc., and soon we had wooden floors in most of the tents.

Two mess halls were set up in the center of the camp within walking distance of every soldier. Picnic tables were built, and later, a couple of dining tents were added.

One of our best improvements was our recreation tent. We erected a GP large tent, built a wooden floor, tables and benches and put in a TV and VCR. Over the succeeding weeks we filled it with games and reading material sent from home. In the evening

two movies were shown. The tent also served as a meeting room and our chapel.

We established a six day work week, with Sunday being the normal day off. Training was conducted from 0800 until 1500. PT or sports was conducted in the afternoon. Soldiers were not allowed civilian clothes, but on their day off were allowed to lounge in their PT gear.

Our quality of life continued to improve daily with new innovations. In November we were issued a 5,000 gallon Mercedes commercial water truck. We were also issued a refrigerated trailer to keep food and drinks cool. During our three month stay in this area we only consumed two Class A hot meals - Thanksgiving and Christmas dinners. The rest of the meals consisted of a T-ration breakfast and dinner and an MRE lunch. In mid-December this routine changed when the army ran out of T-rations. Breakfast and dinners changed to Hormel brand Lunch Buckets, a microwave style meal that we could heat up by using hot water. These were supplemented with canned and fresh fruit, candy and pita bread from the local economy. The novelty of this quickly wore off since 90% of the meals were either spaghetti or lasagna. Sodas were issued on the basis of two per man per day and were cooled in our reefer van. No ice was available. A PX truck run by DIVARTY came by once a week and soldiers were able to supplement their diet with snack food, but this and supplies from home through the mail was their only sources for variety.

Water re-supply initially was a large problem. We quickly found that our 2½ ton trucks could not pull a water trailer over our sand road to the resupply point located on the paved road six miles away. We had to rely on our 10 ton ammunition HMMET¹⁶ trucks for this mission. Water re-supply took a heavy maintenance toll on vehicles and people. During the first month we limited showers because of this. After the acquisition of our commercial water truck our re-supply problems were solved. The later construction of a road in the 2nd Brigade's area by the engineers also helped re-supply.

Drinking water was supplied by the Saudi government in the form of liter water bottles. Bottled water was in plentiful supply and one of our few comforts. Eventually it was planned that we would drink water from our water trailers as soon as re-supply became easier. This water came from wells and did not taste good. Rather than risk soldiers not drinking water, we stayed with the water bottles throughout the campaign.

The battalion began formal training on 29 October, a week after the Red Dragon Den was established. There was some apathy towards training at first, attributable I believe, to the heat. Until late November we had to modify our training schedule to compensate for it. We took our lunch break at noon and then gave the soldiers a three hour break during the hottest part of the day. At 1500 training started again until 1630 - 1700. PT was

¹⁶High-Mobility Multipurpose Equipment Transporter, 10 ton utility truck. In artillery battalions primarily used to transport ammunition.

difficult to do during this period but picked up as the weather cooled after Thanksgiving.

Training concentrated initially on section and platoon training. The artillery gunner's test was administered to all 13 Bravo¹⁷ sergeants and artillery lieutenants. An eight hour platoon certification test was developed and during late November and December platoons were called out one at a time unannounced, starting early in the morning before sunrise. Manual gunnery, almost a lost art, was stressed during these certifications because we were concerned about the ability of our computer systems (TACFIRE) to operate during the hottest parts of the day.

During the past year the battalion had great success developing a proficiency in firing accuracy and safety. We validated this both at the NTC in December, 1989 and during an ARTEP¹⁸ in March, 1990. However, our timeliness in occupying firing positions was slow. We could make ARTEP standards (which we considered to be very generous) but our NTC experience demonstrated that we were delaying the maneuver commander's tactical plan considerably. This problem was not unique and was experienced by most artillery units. Before Desert Shield the battalion had started preliminary planning for our next NTC rotation to improve timeliness.

¹⁷Artillery enlisted Military Operational Skill (MOS).

¹⁸Army Training and Evaluation Program, an annual field evaluation administered to battalions to evaluate their training readiness.

The time that we had available and the flexibility allowed commanders during Desert Shield created a perfect situation to develop new techniques. The battalion developed a "battery wedge" movement formation and, using some innovative gunnery techniques, sliced our occupation times in half. Taking this idea one step forward, a "battalion wedge formation" was also developed. I had pledged to the 2nd Brigade commander that we would be able to stop and mass artillery fires within 15 minutes of receiving a fire mission and would be able to meet all the requirements for accurate, predicted fires.¹⁹ This was a tough standard since most artillery battalions at the NTC often take 30 - 40 minutes to mass under the same conditions. By using our new techniques we were able to routinely achieve times of 8 - 10 minutes. This great success was attributable to several factors: (1) great ideas by soldiers, (2) soldiers being well-versed in artillery basic skills which allowed them to be innovative and still safe, (3) flexibility of both leaders and soldiers, (4) time and resources to drill new techniques.

I do not know if the 3/82 FA had the original idea for the artillery wedge formation. No one told us about it. We developed it from some wargaming ideas with the DIVARTY commander in early November. Our techniques were briefed to several other artillery units and were adopted within the 1st CAV DIVARTY.

¹⁹Accurate predicted fires require a surveyed location and common direction, current metrological data, current muzzle velocity error, safety data and powder lot management.

Most Army artillery battalions in theater eventually worked from some type of wedge or open formation.

The 2nd Brigade commander also developed a "brigade wedge formation" which greatly enhanced the brigade's ability to maneuver across the desert and to react to tactical situations. In this formation the brigade travelled in an inverted "V" formation with TF 1-5 in the lead at the point. TF 1-32 moved on the left flank and TF 1-8 on the right. 3/82 FA was positioned directly behind TF 1-5 and B Co, 8th Engineers followed us. Trailing behind the formation was the combat trains for each battalion. Colonel House and I (as the brigade fire support officer) travelled in an M113 directly behind the lead company of TF 1-5. We were accompanied by Major Hart, brigade air liaison officer, in an M113. Both vehicles were secured by an M-1 guard tank.

Since the 1st Cavalry mission remained throughout the campaign one of movement to contact, attack and counter-attack, the wedge formations became standard for both the battalion and the brigade. Both wedge formations are detailed in published articles which are included as appendices to this paper.

In late November and mid-December the battalion was able to conduct live fire exercises validating our wedge formation. The brigade also conducted exercises concentrating on both movement techniques as well as working air support coordination.

Quality of life continued to improve. By Thanksgiving the Red Dragon Den was quite comfortable. Most soldiers were able to

take a hot shower at night, and we had enough recreational activities to keep them occupied during their free time. In late November we were able to take about half the battalion to the theater's R & R center at Half-Moon Bay located near Dhahran. This was a three day event. The rest of the battalion was scheduled to go after Christmas but never made it due to Desert Storm.

We attempted to keep an atmosphere of normality. The officers continued monthly hail and farewells. In late November, we received a new battalion XO, Major Dave Currid and on 1 December Captain George Allen relinquished command of Service Battery to Captain Jeff Kozlovich. Both moves had been planned before deployment and were executed now because hostilities did not appear imminent. We scheduled the 1st Cavalry band to come into our area to play a few times. In early December the Division established a bank of 40 phones for use in calling home. We were given access to these phones every fifth day for a four hour period.

Mail was a significant factor. Until the phones were put in it was our only link with home. Time to receive or send mail varied but two to three weeks was the normal expectation. Mail was important both for morale and as a source of supply. For the units that deployed early, mail from home supplied razor blades, toothpaste and other sundry items as well as foodstuffs to supplement our bland meals.

The famous "any soldier" letters actually began for us before we left Ft. Hood and increased in volume every day. We continued to receive them until we redeployed. The "any soldier" mail was 99.9% positive and many "new relationships" were formed through this medium. An enormous amount of magazines, games, candy, food, books, videos, etc., were received. We heard from schools, churches, veteran groups, scout troops and numerous other organizations. So much was received that we used a 10 ton truck to pickup mail, sometimes twice per day. The battalion TOC flew three different American flags that were mailed to us and then sent back to towns in the U.S.

When we picked up mail we were also issued newspapers. During Operation Desert Shield and most of Desert Storm the battalion allowance was usually eight to ten Stars and Stripes, two or three copies of USA Today and a few Newsweeks or Time magazines. The newspapers were always three to seven days old. In my opinion this was a poor effort to get the news to soldiers who thirsted for it, especially when it seemed like the further one went back towards the rear the more newspapers were observed in quantity.

Radios were very popular. At the Red Dragon Den we could not pickup the AFN²⁰ signal. As we moved north during January - February and during Operation Desert Storm there would be some locations where we could receive AFN. Shortwave radios sent from home became very popular because they could always receive the

²⁰Armed Forces Network.

BBC or Voice of America. Even Radio Moscow could be received and it broadcast adequate world news. During Desert Storm our short-wave radio in the TOC kept us informed of the events of the war as much as our own situation reports received from higher headquarters.

The battalion established a monthly newsletter to send back to wives at home. The DIVARTY was provided with a video camera which we used extensively to make videos to send back to our families. Unfortunately, the sandy conditions ruined the camera by January, 1991.

Local purchase was authorized to supplement our supply system. Initially money and authority to purchase local supplies was retained at DIVARTY. This did not work well. It took several days (sometimes weeks) to see the result of a request and the DIVARTY field ordering officer was overwhelmed trying to support too many customers. In late November we were finally given the resources to make local purchases. This proved to be very successful. Our field ordering officer, Captain Joe Morris, was able to "find" resources through some very aggressive shopping. Much needed sandbags, water cans, tools, and even parts, were purchased.

The battalion had two key events during this period. One hundred and fifty soldiers were selected to hear Secretary of State Baker address the Division on 4 November. A photo of the battalion at this event was later published in "Time" and "Life" magazines and several books that came out after the war.

On 21 November Peter Jennings, the ABC evening news anchor, and Roone Arledge, the president of ABC, visited in the battalion and filmed a story.

Our greatest shortfall in training thus far was with our fire support sections. By now they had been integrated into the teamwork and maneuver schemes of the mechanized infantry and armor units that they supported. We were concerned that most of the FIST had not been able to observe live fire missions since arriving in country and little serious fire support training or evaluation had been done external to the team itself. In December, the Brigade Fire Support Officer was directed to develop a FIST certification test to be administered in late December or early January.

We were also very concerned about the ability of the M981, FIST-V²¹ and its ability to keep up and blend in with the M-1 tank and the Bradley Fighting Vehicle. Our NTC experience indicated that the enemy singled out this unique vehicle and killed it early. The FIST-V was also slow, and the 10 minutes that it took to erect the hammerhead in order to employ the laser range finder took too much time during offensive operations. The FIST-V was designed for the defense and the terrain of Europe, not the offense and open terrain that we were exposed to in the desert. Also, without the ability to stop and to find known points the north seeking gyro would be of little help for navigation and target location.

²¹Fire Support Team Vehicle

Once again GI ingenuity paid off. In early December the 1st Cavalry Division was issued new, improved M-1 tanks and Bradleys. The old Bradleys were to be used as theater replacements and then shipped back to CONUS after the war. The battalion CSM and some innovative mechanics and commo soldiers were able to take a borrowed, old Bradley and transfer all of the fire support equipment into it from a FIST-V. A machine shop at the port of Damman was enlisted to help make brackets from a design devised by our maintenance section. By adding a GPS²² the converted Bradley had all of the technical capabilities of a FIST-V. The prototype was demonstrated to the DIVARTY and 2nd Brigade commanders and then to the division commander, BG Tilelli. Approval for four Bradleys to be converted was given. These went to the lead FIST team in each task force and to the Brigade COLT²³. During combat these converted Bradleys would be significant. Not only could they keep up and blend in with maneuver forces, but they also could stop and employ their laser range finders within seconds.

Another weak area in the battalion was medical evacuation. The battalion surgeon was only authorized a HMMWV and a 2½ ton truck. In comparison, maneuver battalions had a M113²⁴ for their

²²Global Positioning System, a navigation device that receives satellite signals. GPS was able to achieve accuracy within 1.7 meters under optimum conditions. When Desert Storm began each FIST team in the battalion was equipped with a GPS.

²³Combat Observation Lasing Team, a fire support team controlled by the brigade fire support officer.

²⁴Armored Personnel Carrier.

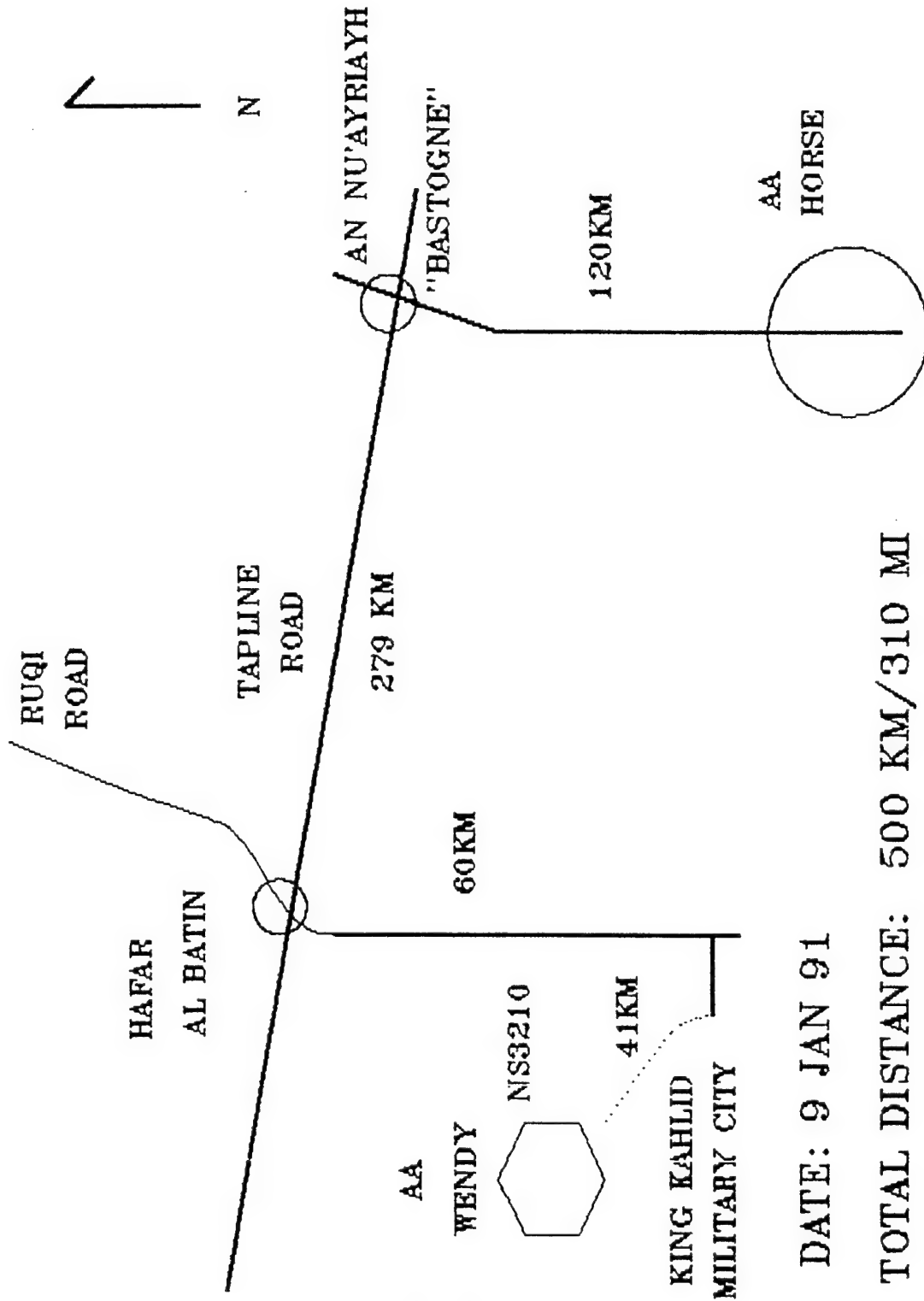
surgeon as well as one per company for the company medic. The 2nd Brigade commander loaned us one M113 which we used for our surgeon. We took two of our four extra FIST-Vs (made available by the conversion of the Bradleys as described earlier) and modified them for use by medics in the firing batteries. We also conducted a number of evacuation drills experimenting with different methods and vehicle configurations in which to evacuate casualties.

I was very surprised at how much latitude the battalion commanders were given throughout the campaign in comparison to the much more direct guidance that we were used to receiving in garrison at Ft. Hood. At the port I set the battalions schedule and determined when we were ready to move. During Desert Shield we established our routine in the LSA, and we developed our own collective training programs. Of course the respective commanders were briefed and gave guidance, but there was great latitude. We were not visited regularly nor inspected, which made for a very positive command climate.

TAA WENDY - 5 January - 16 January 1991

In late December we were alerted to begin to make preparations for a move north. The Division was being moved and would concentrate around King Khalid Military Center (KKMC) in TAA Wendy. On 5 January 1991 we struck our camp of three months and began the long move north.

AA HORSE TO AA WENDY



MAP 4

DATE: 9 JAN 91

TOTAL DISTANCE: 500 KM/310 MI

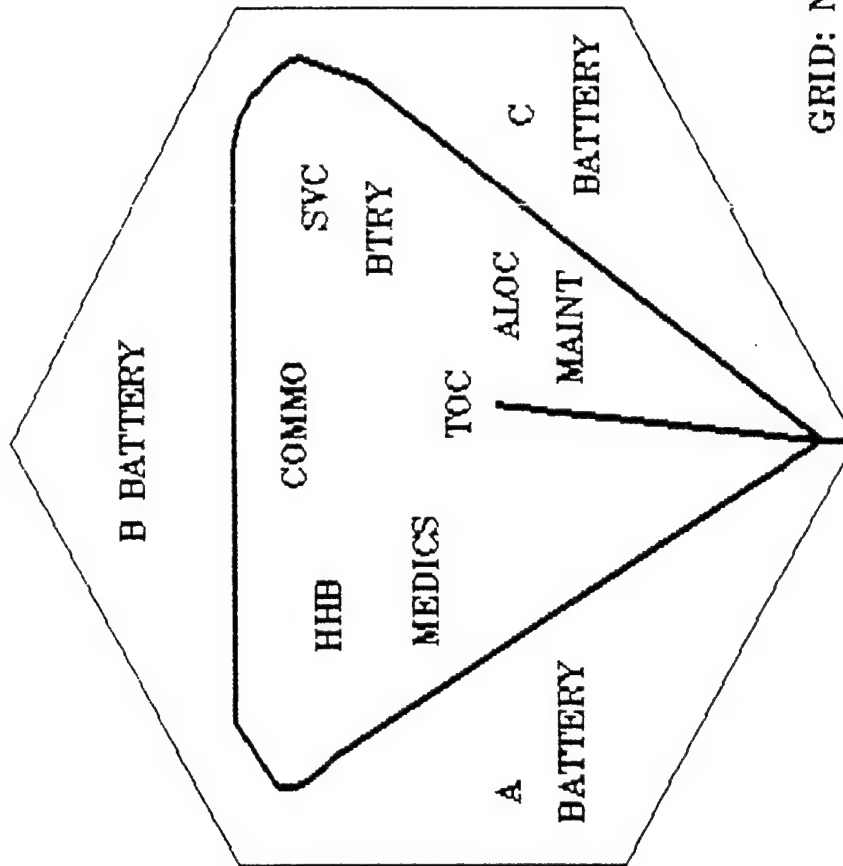
KKMC is located about 15 miles south of the city of Hafir Al Batin and is 40 miles south of the Iraqi border. From the division's initial location (TAA Horse), KKMC was about 100 miles north and 150 west.

During this period additional forces were being brought into theater including the 1st Infantry Division from Ft. Riley and the VII Corps from Europe. Transportation assets were scarce. Our move to TAA Wendy was to be a lengthy operation for this reason. It took us almost six days to close the battalion. We were allotted a small group of lowboys and buses each day. I departed on the first day with our largest convoy consisting both of wheeled vehicles and lowboys with tracks. The S-3 had preceded the day before with an advanced party. I left the XO behind to supervise the loading and movement of the rest of the battalion. I did not see him again until the 14th of January when our last vehicles closed.

KKMC is a large, sprawling military complex built by the Saudis in the mid-80s for just the kind of contingency that we were in. It was used primarily by headquarters, medical, signal and logistical troops. Some replacement troops were also stationed here as well as special forces and intelligence operations. Combat units were positioned well outside of KKMC and were not allowed on post. As usual the rear echelon types were able to enjoy hot showers, a PX, etc., creature comforts normally denied to the front line troops. 3/82 FA was located inside TAA Wendy in a tactical assembly area 10 km northwest of KKMC.

BATTALION LAYOUT FOR

AA WENDY



GRID: NS3210

RT RED

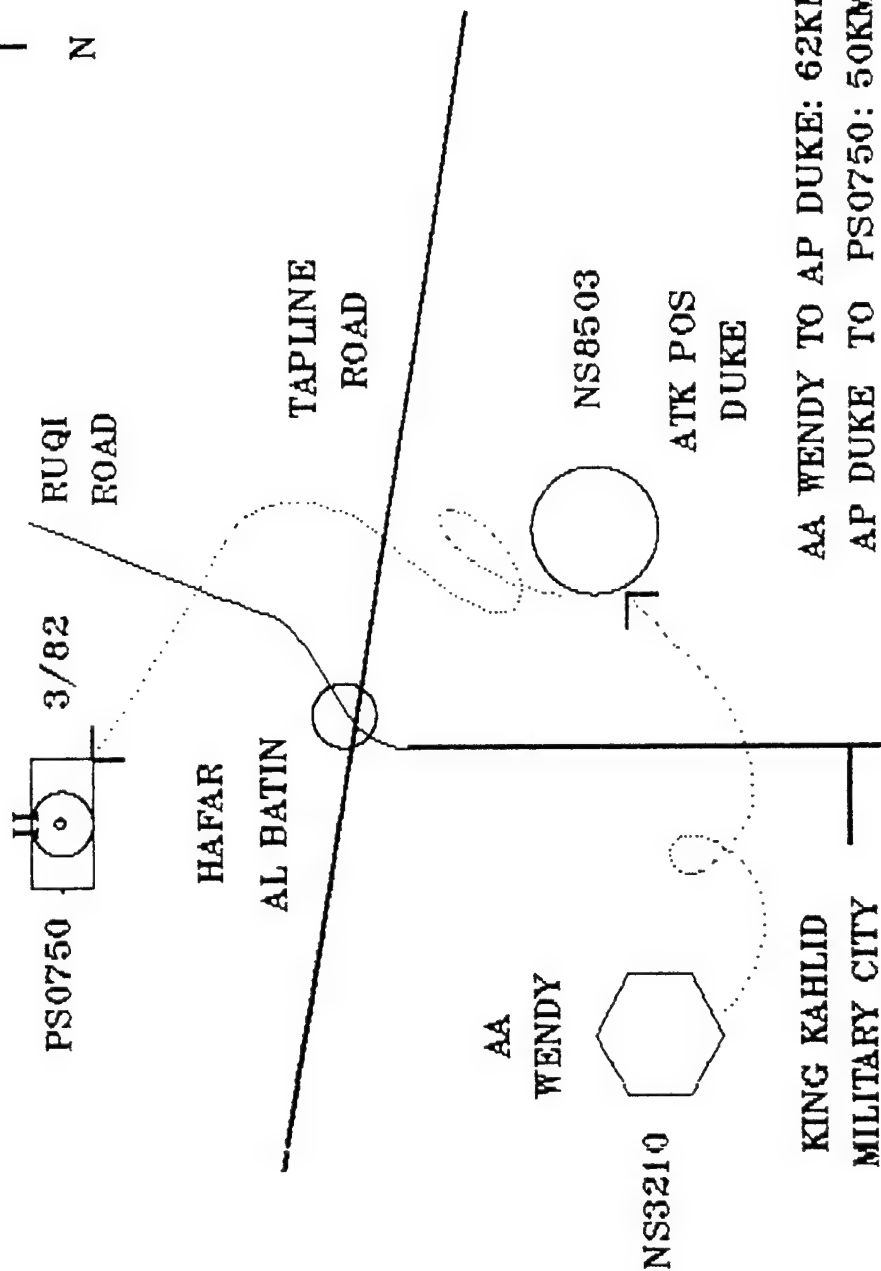
The terrain around KKMC was much different from where we had been before. It was very flat and much less sandy. There were no Bedouin tribes or camel herds in this area. Just northeast of KKMC and running north towards Hafir al Batin was a large wadi complex known as the Wadi al Batin. Near KKMC it was very pronounced but tapered off as it went north. This wadi system continued north into Kuwait and would be prominent during future operations of the division.

ROAD MARCH FROM HELL - 13 January 1991

No one in the 1st Cavalry Division will ever forget the 13th of January 1991. It was a cold, wet Sunday. All the battalion commanders and above had been called to a briefing with the division commander at his headquarters in TAA Wendy that afternoon. We received a three hour briefing on the offensive operation that would be executed sometime in the next 30 - 60 days. Planning for this operation had apparently been going on since November, 1990. The brigade commanders and selected division staff had been involved but this was the first time battalion commanders had been brought into the plan.

At 1600, as I was driving back to the battalion from the meeting, I received a radio call that the division had been alerted to move out on short notice. The VII Corps commander (1st Cavalry was attached after the move to TAA Wendy) was concerned by intelligence reports that indicated Iraq might conduct a pre-emptive strike across the border to seize KKMC. At

AA WENDY TO AA DUKE AND NORTH OF TAPLINE



this time KKMC had developed into a tremendous logistics base as supplies were brought in to support the offensive operations for the left hook of the ground campaign conducted during Operation Desert Storm. The only ground combat forces in the area was the 1st Cavalry Division and a French armored brigade. We were ordered 100 km northeast to secure an avenue of approach that straddled the Tapline Road.²⁵ We were to secure an objective just to the southeast of Hafir al Batin and to support a brigade of the 101st Air Assault Division that was being moved at the same time to secure Al Qaysuiman, a village on the avenue of approach to our north.

The 2nd Brigade was told to begin immediate movement and the first task force started movement 30 minutes later, at 1700. 3/82 FA started moving at 1730. The conditions were not good. It was dark by 1730, and it was cold and raining. We were moving over ground that had not been reconned, and our route of march would take us through the Wadi al Batin. Although the battalion had almost all of our vehicles closed into TAA Wendy by now, we were short 300 soldiers who were currently enroute in buses from our old position in TAA Horse. The XO, who was in charge of our part of that convoy, was not in communications range. If we had to fight we would have howitzers that we could barely man. In fact, I had to press mechanics into service just to drive some of the howitzers as we moved out. A small guard force under the

²⁵Tapline Road, a paved road running parallel to the border and the main supply route for the ground forces.

Service Battery commander was left to guard tents, equipment and ammunition that we simply did not have time to load.

The rain had caused "supkas" to develop in the sand. A supka is an area where moisture remains in the sand and is best described as quicksand. A supka can exist in the desert even though it has not rained for several months. They are not dangerous to individuals but tracked vehicles can become easily stuck. We spent quite a bit of time negotiating supkas, especially in the wadi area. Stuck vehicles that proved difficult were left behind with their crews as guard. Wheeled vehicles that were towing trailers had a very difficult time. A number of tracked vehicles threw their tracks when they pivoted too hard in the wet sand. Lost units and individual vehicles was not uncommon throughout the Division.

The "fortunes of war" are amazing sometimes. I was very worried about being able to link-up with our 300 soldiers that were enroute. At mid-night, as the battalion was crossing a paved road that led into KKMC, our buses came driving up with the XO in the lead. This was an unbelievable stroke of luck with incredible odds of occurring. The convoy that our troops were in had been stopped several miles east of Hafir Al Batin on the Tapline road and alerted that the division was moving, but no other information was provided. Taking charge, the XO separated our buses, and continued forward as quickly as possible. He was able to make radio contact with us a few minutes later.

By 0500 we had closed into our new position (Attack Position Duke) after having to refuel the battalion enroute, a tough mission that was pulled off by the XO, CSM and Service Battery XO. We spent the rest of the day recovering a few vehicles that had become stuck or had thrown tracks. I was very pleased in the maintenance condition of the battalion. We lost nothing to mechanical failure.

From the 14th until the 16th we planned a defense of our new area. Tents and extra equipment that we did not think we would need were placed in storage at our old position in TAA Wendy. The brigade consolidated equipment and left a small guard force there until after the war. All of our creature comforts were left behind. I had each battery bring a couple of GP medium tents forward that could be erected during bad weather and when time permitted. Enough cots were brought so that crews could "hot bed" or rotate in and out of them. Rudimentary portable latrines were constructed that could be hastily disassembled and taken with us.

Between the numerous sandstorms and high winds that we had experienced since arriving in October our camouflage nets were virtually destroyed. After leaving TAA Wendy the Division no longer put them up.

While we were in this position we made our first contact with 3/20th FA, an M109 battalion from Germany. They were designated as the battalion that would be reinforcing to the Red Dragons during future operations. The 3/20th FA had just arrived

in country and still had some of their assets aboard ships or at the port. Some of their critical maintenance vehicles had not arrived yet. We assisted them as much as possible. I was very impressed with the professionalism of this battalion. They quickly adopted the wedge formation and other desert techniques that we had learned.

At 2130 on 16 January 1991 I was called to a meeting at the 2nd Brigade TOC. The battalion commanders were told that the war might start before morning. Our mission was unclear. The Division was the theater reserve and had contingencies planned for counter-attacks in the event of a breakthrough of our lines or was prepared to exploit any success by our forces.

KEY POINTS, LESSONS LEARNED - OPERATION DESERT SHIELD

1. Soldiers trained well in the "basics" of their profession can then adapt to any situation. One of our strongest traits as a profession is flexibility.

2. Commanders should encourage good ideas and allow them to surface. Not all good ideas will be used but soldiers need to feel confident in their ability to suggest change or a better idea.

3. Training programs during peacetime need to stress living in the field and practicing field sanitation for sustained periods of time.

OPERATION DESERT STORM

AIR CAMPAIGN, 17 January - 23 February 1991

At 0205 on 17 January we received the following message from DIVARTY over TACFIRE:

100 TOMAHAWK MISSILES HAVE BEEN LAUNCHED
AGAINST IRAQ. D-DAY IS TODAY.

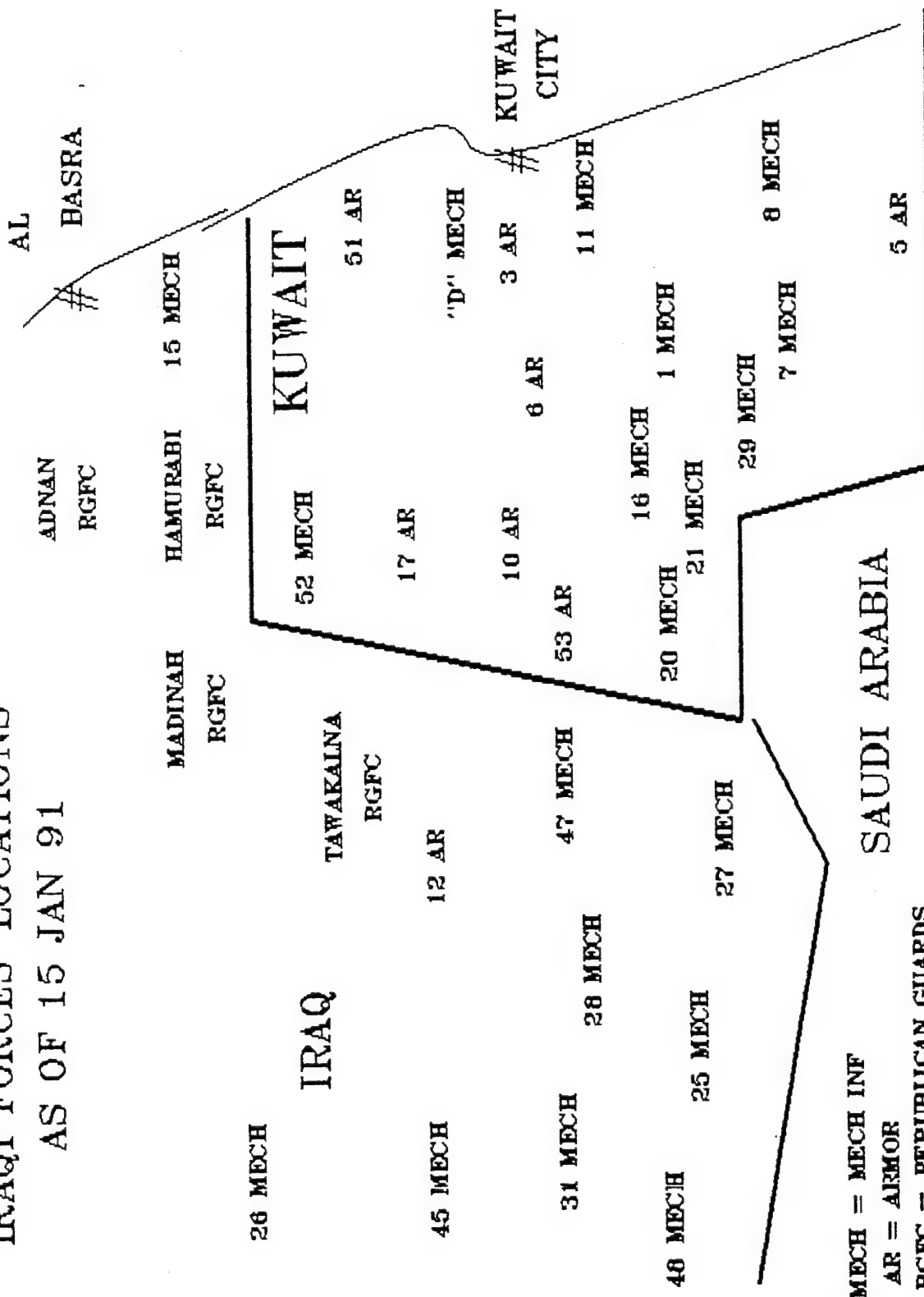
Shortly after, a Scud missile alert was announced and the division went to MOPP level 2.²⁶ Like the many Scud alerts that we were to experience in the future, nothing happened from our viewpoint.

Directly to our north, along the Tap Line road and near Al Qaysuiman, the village being defended by the 101st Airborne, there was an electric power plant. It was brightly lit and very visible from our position. At 0300 it suddenly went dark and explosions were heard. We had been told that Hafir Al Batin was a haven for terrorists and we were concerned that terrorists or infiltrators might be attacking the power plant. This was never confirmed. But this event, combined with the Scud alert and the unknown, kept tensions high in the entire brigade battle task force for the rest of the night.

At the meeting at brigade the night before I had received a warning order that the division might move north soon. At 0330 this was confirmed with an SP (starting position time) of 0600.

²⁶Mission Oriented Protective Posture, a nuclear, biological or chemical threat readiness personnel readiness state. At MOPP 2 soldiers are required to wear the chemical protective suit and boots, but not the gloves or protective mask.

IRAQI FORCES' LOCATIONS AS OF 15 JAN 91



MECH = MECH INF
AR = ARMOR
RGFC = REPUBLICAN GUARDS

ONLY DIVISIONAL UNITS SHOWN NOT TO SCALE

The battalion was basically ready to move so little preparation had to be done. Most soldiers stayed up the rest of the night, many listening for news on shortwave radio. Occasionally our planes could be heard flying overhead.

Prior to moving out, battery commanders were instructed that soldiers were permitted to load magazines into their weapons. Live ammunition was placed in the machine gun ready boxes and hand grenades and stinger anti-tank weapons were issued.

At 0600 the brigade moved out in the early dawn light and quickly formed into a brigade in column, battalion in wedge formation - the first time all vehicles in the brigade had done this. It was a very smooth operation. Our destination was a TAA about 40 km away (3-4 km northeast of Hafir Al Batin).

At 0630 lead elements of the brigade had reached the Tapline Road. Before they could cross the division was halted in place. To our front was an Egyptian division that was trigger happy. The division was halted until proper coordination could be made with them before we moved.

The brigade waited in a tremendous formation spread out from horizon to horizon. The Tap Line road to our front was bumper to bumper with VII Corps and 1st Infantry Division vehicles moving west. About mid-afternoon the brigade was told to return to its original positions of that morning. The brigade reversed itself and had just began to close into its old positions when another order from division cleared us to cross the Tap Line road and move north.

The brigade commander gave each battalion commander instructions that we would move as quickly as possible to our new positions but that some might not be able to make it before nightfall. At dark, battalions that had not yet closed were instructed to halt in place for the night. The division commander did not want to risk a fratricide²⁷ incident from the Egyptians.

The 3/82nd FA was the last combat battalion in the brigade march order. The S-3 was sent ahead to recon positions. We raced forward and closed into the TAA at dusk. We did not want to be the battalion that did not close into the TAA that night. The brigade commander observed our move and paid high compliments to the battalion for its fast movement and discipline. Once again the battalion made a long, tough move at high speed without losing a vehicle to maintenance.

We were aware that the air campaign was meeting with great success, but we had very few details. We believed that the ground campaign would start in seven to ten days.

On 19 January we were alerted that the Syrian Armored Division was to our west and would be re-positioned to the east beginning at 0400 the next morning. There was great concern at Central Command about fratricide, especially since the Syrians were equipped with Soviet style vehicles and looked very similar to Iraqi vehicles.

²⁷Friendly fire.

The 1st Cavalry Division was almost moved south in order to allow the Syrians to pass. BG Tilleli, the 1st Cav commander, fought hard not to have to move and won. Our orders were to hold everyone in position, especially at night. If fired upon we were to move out of the way. We were only allowed to return fire if American lives were at risk. When moving at night the Syrians were to turn on their service drive lights in order to mark their positions and to identify themselves.

After a 24 hour delay the Syrians finally moved. It took them almost three days to clear the front of the 1st Cavalry Division.

Since our move to KKMC the weather had been very cool during the day and cold at night. Temperatures ranged from the low 40s at night to the 60s during the day (warmer if it was sunny). Skies were overcast much of the time, and it rained intermittently. It was very difficult to do laundry during this period because it took a long time to dry. On a rare sunny day the entire battalion looked like a Chinese laundry because drying clothes were hanging everywhere. The terrain was about the same - very flat and hard sand.

We stayed in this area for 10 days. The division set up a shower point in Hafir Al Batin. We were able to rotate the entire battalion through this facility twice. This was the first decent, hot shower we had really had since departing Ft. Hood over three months before. Hafir Al Batin, a city of probably 30 or 40,000 people was completely deserted. For several days after

the air campaign started all roads leading south were packed with Saudis and refugees going south. Just to the west of Hafir Al Batin was a tremendous refugee camp with people from Kuwait. Most of these people stayed in place after the war started.

Mail slowed considerably after the move from KKMC and phone calls stopped almost completely. There were some international phone booths in Hafir Al Batin that were used for emergency calls, but this was very limited due to the terrorist threat. We were successful in keeping our family support group informed of our situation with phone calls from here to key wives.

LTG Freddie Franks, VII Corps Commander, visited the 2nd Brigade TOC on the 25th. There was no briefing. He visited with just the brigade commander, the five battalion commanders and the brigade XO and S-3. He told us that the air campaign was going well but slow due to the adverse weather. He indicated that he thought the ground campaign would start during the first week of February.

AROUQI DEFENSE, 26 January - 14 February 1991

On 26 January the division moved north again, this time to within 15 km of the border, well within Iraqi FROG²⁸ and artillery range. The 2nd Brigade moved about 40 km in wedge formation. This move was an awesome display to watch with over 2000 vehicles moving in formation. The weather was perfect with sunny conditions.

²⁸Free Rocket Over Ground.

Enroute we passed through recently abandoned Syrian positions. The area was filthy; the kind of position a poorly disciplined force leaves. We also liberated two shower trailers that the Syrians had left behind. Apparently others did the same because the Syrians complained. Units were instructed to turn these trailers in, an order the Red Dragons selectively disobeyed. Each trailer had two showers and was equipped with a water holding tank and a hot water heater. We positioned both trailers in the combat trains, under the command of the HHB commander, Captain Greg Anderle and his first sergeant, First Sergeant Knight. They were well camouflaged and until the ground campaign started, we operated these showers 24 hours a day rotating soldiers through. When the ground war started we abandoned the trailers because they were too fragile to move.

As the battalion was moving into our new positions on the 26th I was called to a meeting at the Division's Tactical CP. The VII Corps Artillery Commander, BG Abrahms, was there along with the 1st Cavalry DIVARTY Commander and several key members of the corps artillery and division staff. We were briefed on a series of artillery raids across the Iraqi border that would begin soon. The 1st Cavalry Division's artillery and its reinforcing artillery would lead/participate in several. Maneuver elements of the 1st Cavalry would also begin raids and reconnaissance-in-force missions. There were two purposes for these operations. The first and most important was to create a deception that the main attack into Iraq would be coming from the

1st Cavalry Division's area up the Wadi al Batin. This deception, if successful in drawing in Iraqi reinforcements, would isolate those forces when the VII Corp's "left hook" occurred. Secondly, these operations would expose soldiers to low risk combat operations and would serve as a "seasoning experience."

Our first training priority in the new area was to initiate the FIST certification test that the brigade FSO had been tasked to produce. Time, moves and weather had not permitted this when we wanted to do it in late December/early January. One of the most difficult fire support tasks is to mass artillery on a moving target. It is difficult because of the safety limits placed on using the laser range finder on most firing ranges. We felt that this would be one of our primary missions since we were a counter-attack/exploitation force and could expect meeting engagements. Once again, flexibility and innovation took over. As a target for the FIST we used an M113 APC pulling a trailer. The driver wore "laser safe" eye glasses, drove buttoned up and with all the vision ports in the vehicle taped except for those that allowed him to see straight ahead. The M113 moved at an angle away from the certifying FIST team, who lased on the trailer as the target. This process would never have passed a range safety test, but in the desert it worked fine with complete safety in my view. This, combined with some challenging situations, proved to be outstanding training for our FIST.

The remainder of the battalion began to focus on night training, primarily on moving in formation and occupying firing

positions quickly. We used the most likely scenario for an artillery raid. We also emphasized NBC training and decontamination. We conducted a day-long decontamination and medical evacuation drill while in this area.

Meanwhile we continued to observe the air war. We could see and hear planes flying over, and at night one could clearly see bomb strike flashes with the aid of night vision goggles. The sound of continual bomb strikes became our standard background noise.

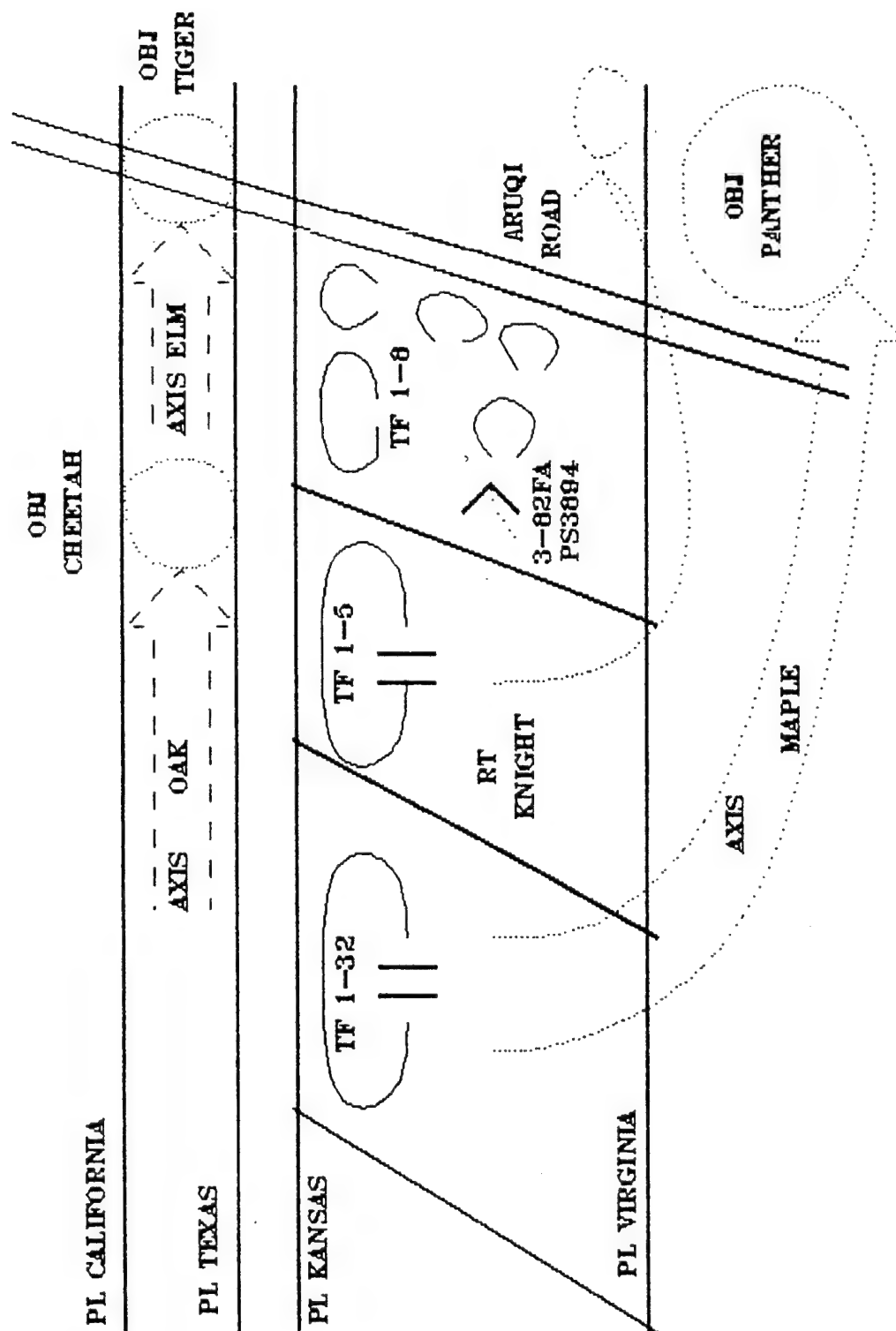
The division's cavalry squadron (1/7 CAV), in its covering force role, began to catch surrendering Iraqi soldiers coming south. This novelty quickly wore off because it was dangerous business.

There were two threats to the division. Terrorists were considered to be the most likely threat. There was also a concern that the Iraqi's might attempt a pre-emptive strike down the Wadi al Batin through the village of Arouqi and on towards KKMCC. The 2nd Brigade stood in their way. Much planning and rehearsal was conducted by the brigade to stop an attack in this area by the Iraqis.

Since the air campaign had started the division observed "Stand to" every morning from BMNT²⁹ until 0630. At stand to every soldier in the division had to be up and at his battle post. It was assumed that an Iraqi attack would come early in

²⁹Before Morning Nautical Twilight, false dawn, usually beginning at 0430.

2ND BDE PLAN TO BLOCK PENETRATION OF ARUQI ROAD



the morning when we were most vulnerable.

Logistics was starting to become critical. Requisitions were not being filled, and we had just about used up the reserve parts that we had brought from Ft. Hood. Every morning during stand to we had a meeting with the BCs and staff. The primary discussion was on spare parts. As soon as stand to was over, several key staff members, supply sergeants etc., would fan out looking for parts from other units and logistic bases. Our success rate was good enough to keep our OR (operational rates) high, always 90% or higher throughout the war.

The war came close to home on 6 February when a HARM missile from an Air Force "wild weasel"³⁰ accidentally destroyed the DIVARTY's TPS-25 ground surveillance radar located 10 km from the border. Two soldiers were wounded.

The division started to see evidence of the psychological warfare that was being waged on the Iraqi soldiers. Leaflets dropped on enemy positions started to find their way into our lines, blown there by the wind. Almost immediately after moving into this new area on the 26th the division had begun to take POWs, most surrendering to the 1/7 Cavalry Squadron which was screening the division's front.

On 4 February the battalion's logistics operations center (LOC), located in the brigade support area (BSA), burned to the ground. The LOC was mounted on a built-up 2½ ton truck. A Saudi purchased kerosene heater, thought to be safe, caused the fire.

³⁰Plane that seeks and destroys enemy radar emitters.

The truck, along with all of the battalion's supply records and a large number of spare M-16 rifles, were destroyed. Fortunately no one was injured despite the ignition of small arms ammunition and a Stinger anti-tank missile that were located inside the truck. The loss of this vehicle hampered future logistics operations somewhat.

The 1st Cavalry went to war on the 13th with a four battery Multiple Rocket Launch (MLRS) raid that started at 1815. It was a very impressive show as the rocket launches were visible throughout the division area. Three enemy Cps and several artillery positions were targeted. The secondary explosions from this attack continued all night and were heard distinctly in our battalion. The Iraqis did not respond to this attack immediately. This was in their favor since there was artillery and MLRS waiting in hide-positions to attack any response.

On the 15th the Iraqis fired three Scud missiles in our general direction. They hit KKMC, Hafir Al Batin and Log Base Echo (VII Corps log base). The battalion command sergeant major, CSM Tolleson was passing through Hafir Al Batin at the time of the Scud strike and narrowly missed being hit. Both he and his driver lost their helmets from the concussion of the strike.

BERM BUSTER II - 16 February 1991

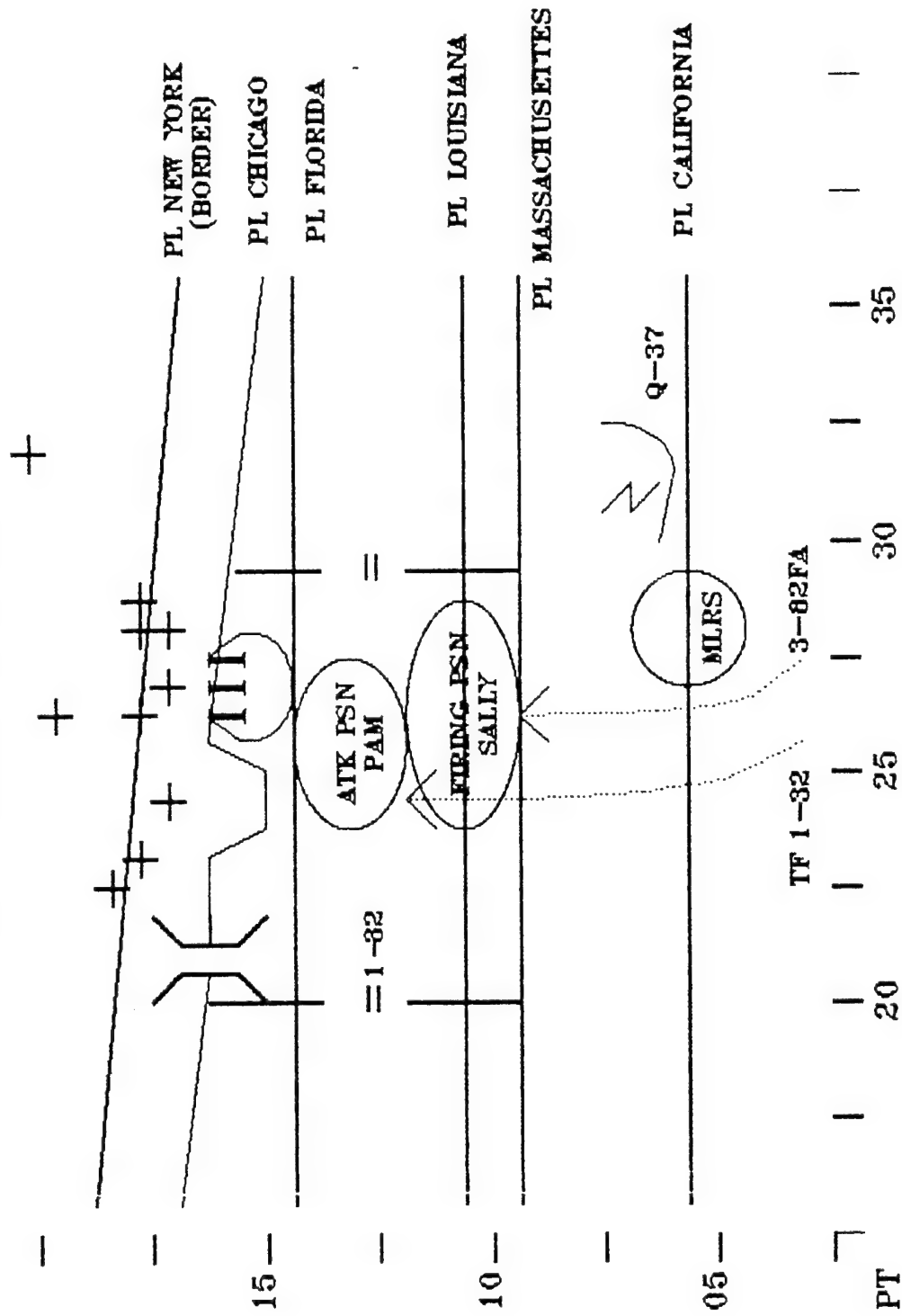
On 16 February the war finally started for us. A task force demonstration by TF 1-32 was planned followed by an artillery raid a few hours later. The Red Dragons would participate in both.

TF 1-32's operation was codenamed Berm Buster II. This operation was designed to test Iraqi response to a breach of the berm that was built on the southern border of the neutral area separating Saudia Arabia and Iraq. It was also to demonstrate strength in the area and to aid in the deception plan that the main allied attack would be coming in this area. Berm Buster II would begin during the afternoon of 16 February and conclude that evening.

Immediately following Berm Buster II would be an artillery raid and feint by the 11th Aviation Brigade code named Red Storm. Three cannon artillery battalions (1/82 FA, 3/82 FA and 3/20 FA, reinforcing 1st Cav), one MLRS Battalion (1/27 FA, part of 42 FA Bde reinforcing 1st Cav Div) and the 1st Cav's MLRS battery, A/21 FA, would participate. This operation was to begin at 0055 on 17 February.

At 1200 on 16 February, TF 1-32, 3/82 FA, B Co, 8th Engr, a Long Range Reconnaissance Patrol (LRRP) and a psyops team began to move into attack positions and at 1530 the first units crossed the line of departure (LD). 3/82 FA raced on the heels of the task force tanks into firing position Sally along PL Louisiana, about 7 km from the LD. As the battalion was making its

EXECUTION AND TARGETS FIRED FOR BERM BUSTER II



occupation, the 1st Cavalry Division Commander (BG Tilelli), ADC-M³¹ (BG Franks) and the ADC-S³² (BG Robles), arrived to observe the operation. The battalion was ready to mass fires in under nine minutes and at 1630 began a six minute artillery preparation on targets around the berm. The end of the prep was marked by four white phosphorous rounds fired by Charlie Battery. The task force provided security while the engineers blasted six lanes through the 15 foot high earthen berm. The 3/82 FA provided cover by laying down a smoke screen to the north of the berm. The brigade COLT (led by 1Lt Skelton) and one of the FIST teams scored kills on two enemy observation posts (Ops) with copperhead rounds. The psyops team emplaced dummy tanks near the breach sites and emplaced a loudspeaker system to replicate tank movement noises. The LRRP team was emplaced on the berm in concealed positions.

As these activities were occurring, the brigade commander's M113, containing BG Franks, COL House and LTC Knight, crossed the berm to observe. This M113 was probably the first allied vehicle from the conventional forces to cross into Iraq during the war.

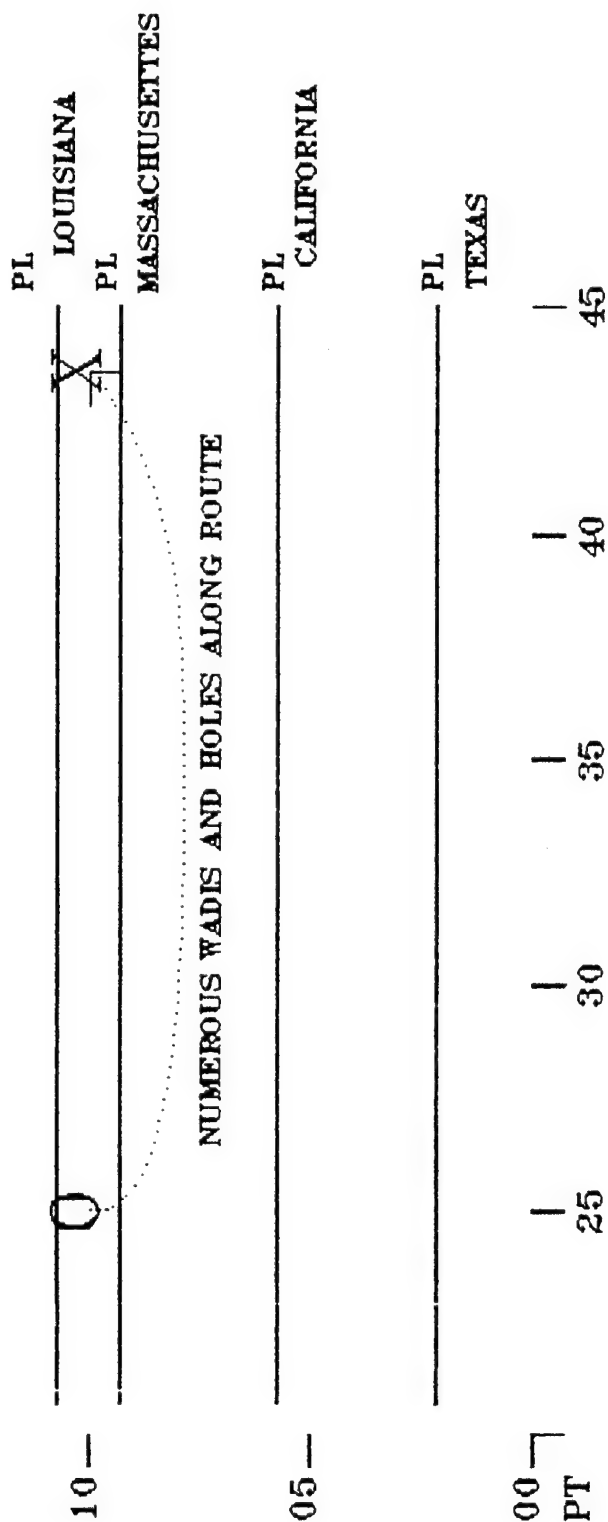
As dusk approached, the task force withdrew from the berm and set up an ambush to cover the breach sites and dummy tanks. This ambush site was maintained all night, but the enemy did not respond. The 3/82 FA provided support until 2010 when it was released by the brigade commander to support Operation Red Storm.

³¹Assistant Division Commander, Maneuver.

³²Assistant Division Commander, Support.

3-82 BATTALION MOVEMENT FROM BERM BUSTER II TO RED STORM

16 FEB 91



TOTAL DISTANCE: 21KM/13MI

TIME OF MOVE

SP: 2010 RP: 2205

RED STORM, 17 February 1991

The battalion had to move 21 km to the east to be in position to support a DIVARTY TOT³³ at 0055 on the 17th. This was a tough move in zero visibility. Only the S-3 and I had reconned the route since it was located in the covering force area and visible to enemy OPs during daylight hours. Enroute one howitzer drove into a tank ditch and two soldiers were injured slightly. Otherwise, the move went smoothly with the battalion closing into its firing positions at 2205, another remarkable achievement. Two factors were significant in achieving this success. By mid-January we had a GPS in each battery commander's vehicle which greatly aided in navigation, and we had night vision goggles for every driver and section chief. Secondly, our night drills and rehearsals made this move almost routine.

At 0055 the DIVARTY TOT was successfully fired. The battalion shot over 100 rocket assisted projectiles (RAP) during a three minute period. The 3/20 FA and one MLRS battery were left silent as an ambush force to attack any Iraqi response. The Iraqis lit up a Racit counter-battery radar which was promptly killed by the 3/20 FA.

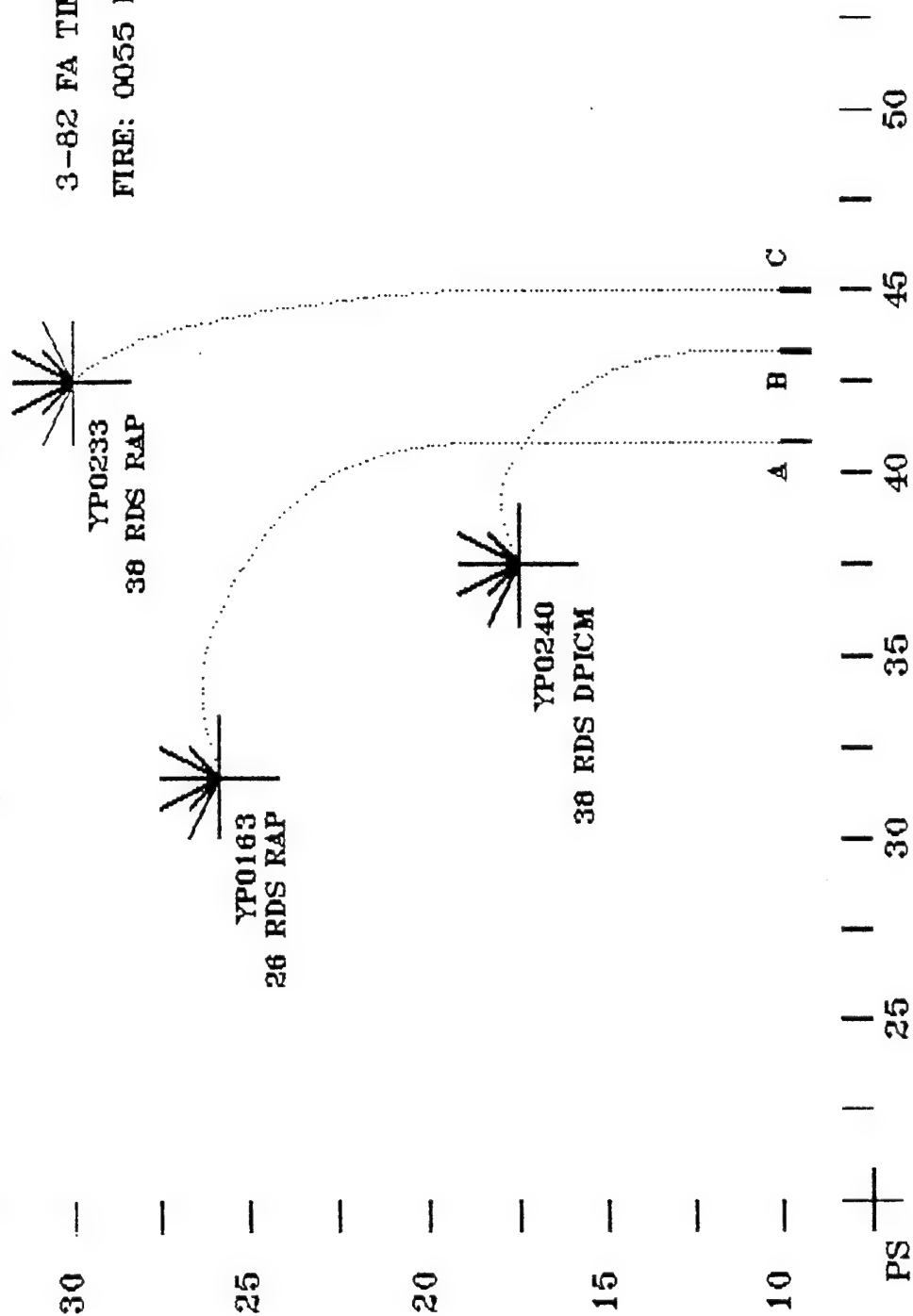
Upon completion of our firing we immediately moved the battalion out of the firing position to a rally point, thus vacating a potential enemy counter-battery target. The battalion moved into a new position in the covering force area, situated in

³³Time on target, a fire mission fired at a specific time. In this case, a DIVARTY fire mission fired by several units and computed so that rounds/missiles would impact simultaneously.

RED STORM ARTILLERY RAID AS PART OF 11 AVIATION BRIGADE FEINT

17 FEBRUARY 1991

3-82 FA TIME TO
FIRE: 0055 HOURS



the Wadi Al Batin and centered in front of TF 1-5 and TF 1-8. As we moved out the 11th Aviation Brigade conducted a feint across the border. The DIVARTY'S targets had been against enemy artillery and air defense sites and had opened up a safe corridor for the helicopters to fly through. Our aviators reported sighting numerous secondary explosions from the artillery strike.

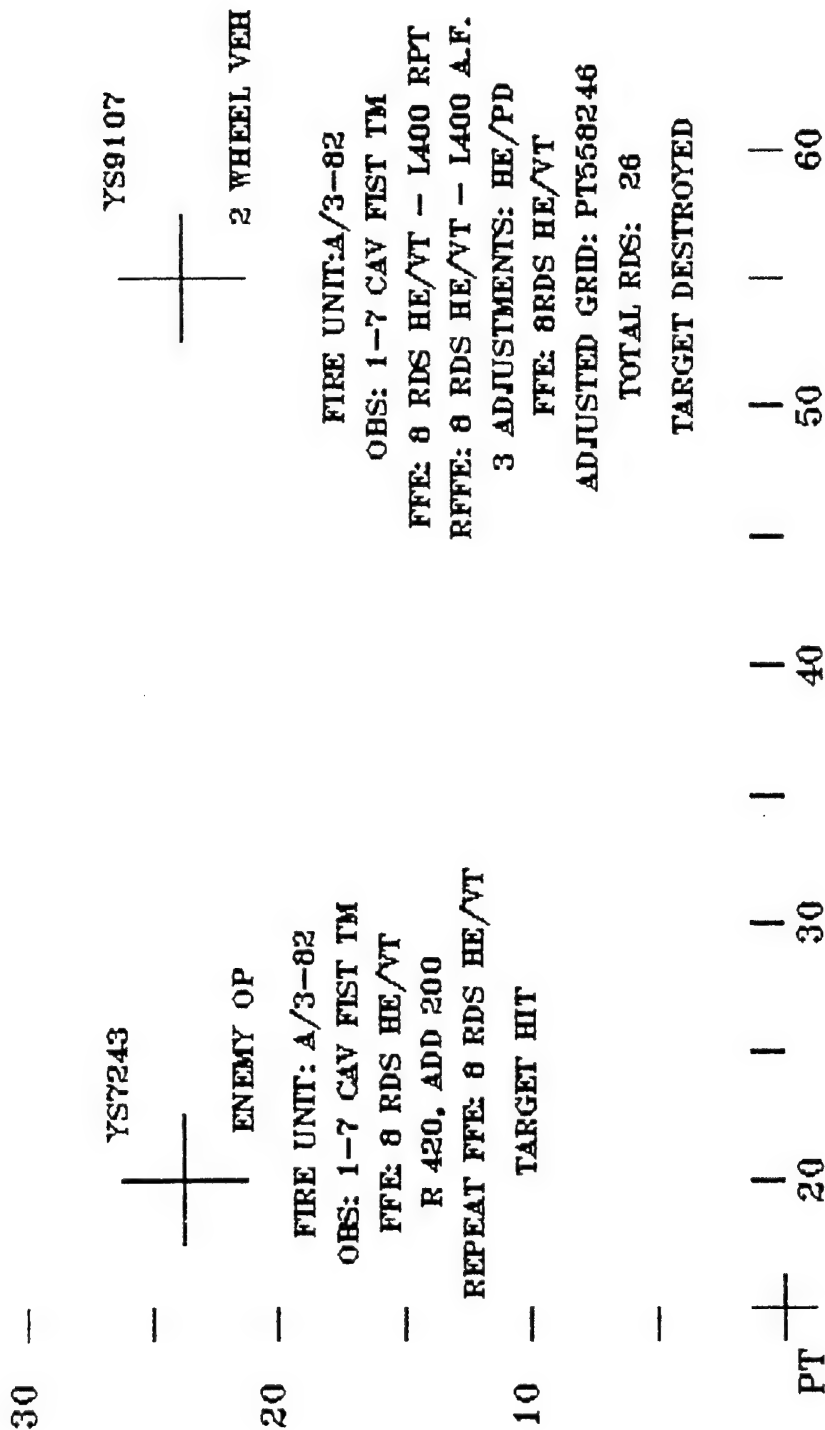
The 3/82 FA completed its move into its new position at 0300.

COVERING FORCE SUPPORT - 17 February - 26 February

After Operation Red Storm we lost 3/20 FA. This battalion had been either reinforcing our battalion or supporting the division's covering force, 1/7 CAV, since the division's move to the border. With the departure of this battalion, it became the mission of the 3/82 FA to support the 1/7 CAV. We were still in direct support to the brigade so our positioning still had to be cleared by 2nd Brigade. We were positioned on the right flank of the brigade as described earlier because of the threat that was still perceived down the Aruqi road.

Beginning on the 17th we began rotating one firing battery several kilometers to the northwest so that we could range the entire covering force area. Several fire missions were processed on the 17th and 18th. On the 18th, 1/7 CAV crossed the border on a short recon mission. Alpha Battery was in position to support and fired several missions. The Iraqis responded with sporadic artillery fires which appeared to be pre-planned rather than

3-82 FA TARGETS FIRED IN SUPPORT OF 1-7 CAV 17 & 18 FEB 91

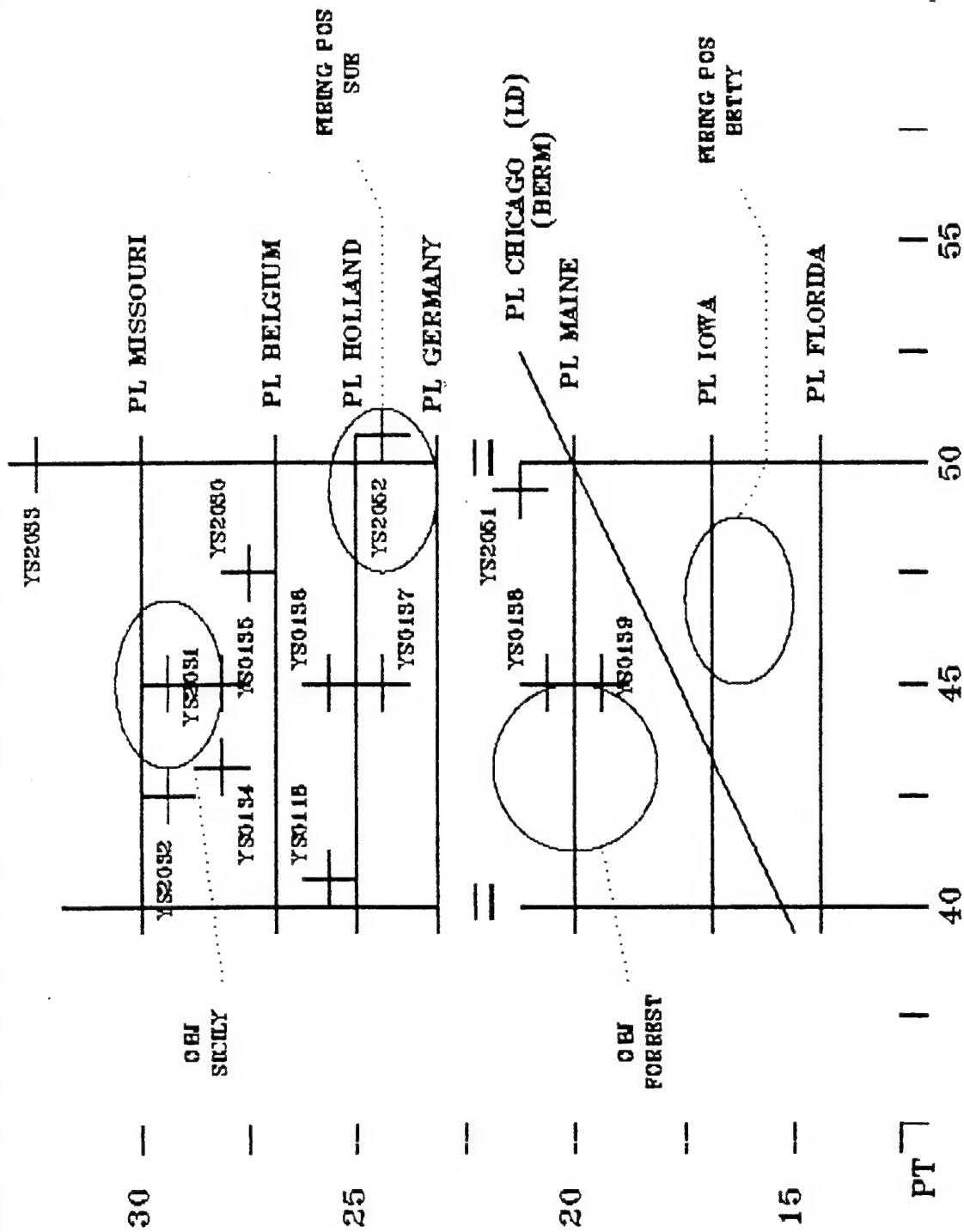


observed. We immediately moved Alpha Battery on a survivability move. DIVARTY radar acquired three acquisitions from the Iraqi fire. One was a revetted position which was destroyed by cluster bombs from close air support. The other acquisitions were from an enemy D-30 (152mm) artillery battery. It was out of our range. A/21 FA (MLRS) fired 27 rockets into the D-30 position destroying it. The CAV squadron terminated their recon after discovering several abandoned enemy positions and capturing several POWs.

During the evening of 19 February TF 1-8 and TF 1-5 conducted mounted company size recon missions eight kilometers deep across the border. During this operation Charlie Battery was moved forward to support.

The battalion was alerted to prepare for Berm Buster III, a raid across the border by TF 1-8. Planning for this operation started on the 18th, but the mission was canceled on the 19th and replaced by Operation Knight Strike.

GRAPHICS AND FIRE PLAN FOR OPERATION KNIGHT STRIKE



OPERATION KNIGHT STRIKE, 20 February 1991

Operation Knight Strike was to be a reconnaissance in zone by TF 1-5. It was to be the deepest penetration of the division into Iraq to date, about 15 km.

TF 1-5 crossed the border at 1200 on the 20th. 3/82 FA had moved simultaneously and was in position (Firing Position Betty) to support the task force as it crossed.³³ A long range preparatory fire mission was fired by A/21 FA (MLRS).

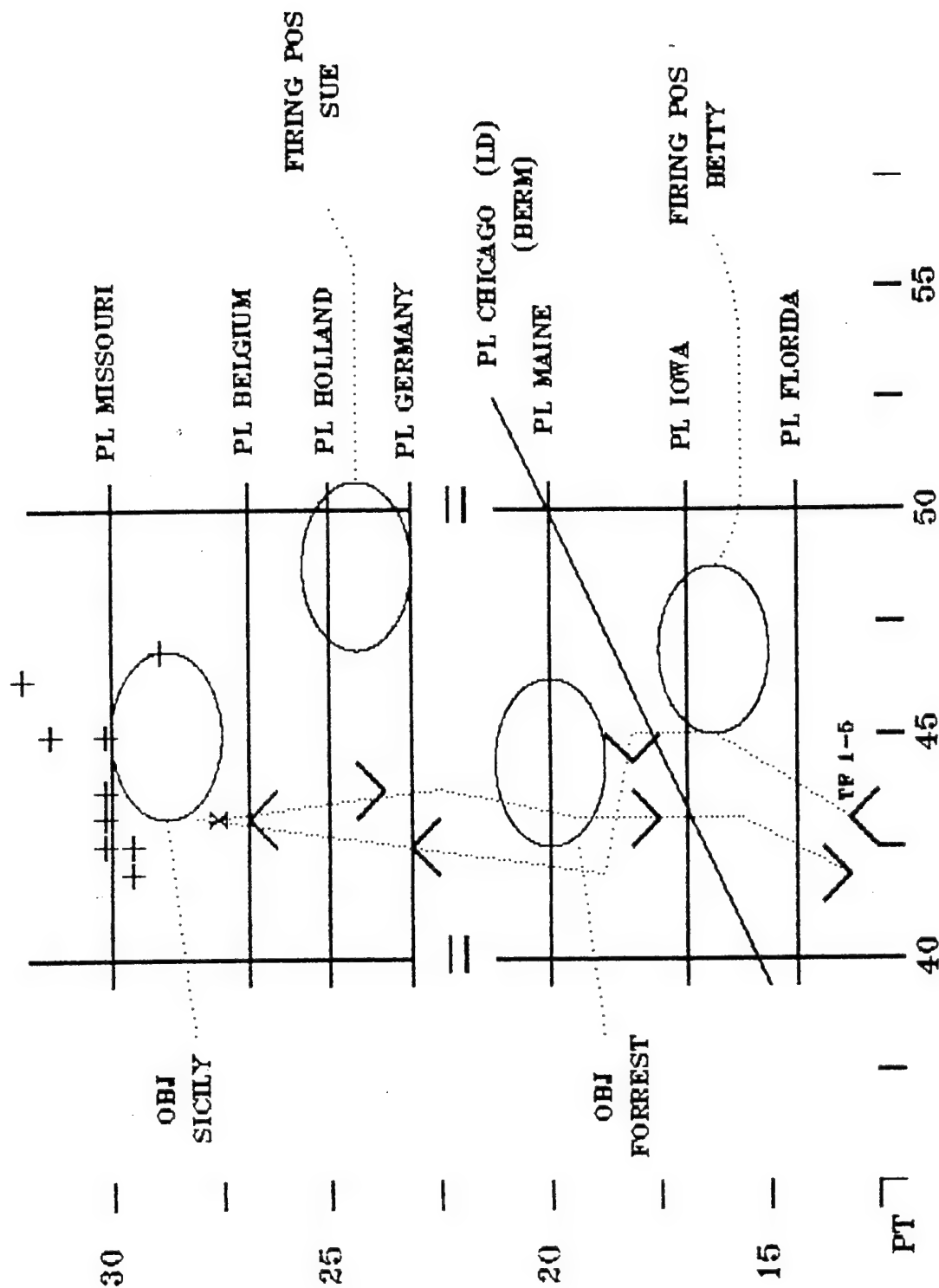
Initially there was no Iraqi response. Many of the obstacles and positions that intelligence had told us to expect were not present. After the task force had moved about 13-14 km it began to pickup Iraqi soldiers who were surrendering. The task force plan to evacuate POWs had been discussed in detail at the brigade back brief the day before. Several empty Bradleys were detailed to retrieve and transport POWs to the rear. These Bradleys were located in the rear of the task force formation. The task force slowed to bring up these vehicles.

Near the PT 29 east/west grid, along PL Missouri, the brigade COLT and the Alpha Company FIST reported sagger missiles³⁴ being fired at them. A Bradley scout vehicle and an air defense Vulcan vehicle were both hit by enemy fire while stopped processing Iraqi POWs that had surrendered in a OP location.

³³Only the three firing batteries and the jump TOC went forward. They were secured by a tank company from TF 1-32 that was detached for this mission.

³⁴Short range, wire guided Soviet anti-tank missile.

EXECUTION OF OPERATION KNIGHT STRIKE



Enemy mortar fire also landed on the U.S. vehicles. Immediate suppression artillery fires were immediately called in and smoke fired. The task force commander also ordered tanks and Bradleys to maneuver in support of the damaged vehicles. U.S. losses in the two vehicles were four killed and seven wounded. One Iraqi POW was also killed by enemy fire and several were wounded. It was later learned after the war that the Bradley and Vulcan were probably killed by enemy sabot rounds fired by short range, Soviet made, A-12 anti-tank guns that were in hide positions to their flank. These guns fired an initial salvo and then ceased fire to keep from being detected. The only accurate mortar fire we ever observed was also fired onto our damaged vehicles. Since the surrendering Iraqis were located at an OP, the grid location was known. Our suspicion is that this attack was a preplanned ambush that sacrificed the Iraqi soldiers manning the OP. This conclusion is supported by similar actions that occurred elsewhere in theater.

The enemy fired some ineffectual mortar and artillery missions. Again, these seemed to be on pre-planned targets and not observed fire. The brigade commander's M113, and several surrounding tanks and Bradleys came under ineffective RPG³⁵ fire indicating enemy troops close by.

The brigade was ordered by the division not to become decisively engaged or to take any more casualties. The task force commander gave instructions to disengage from several small

³⁵Rocket Propelled Grenade.

fire fights which had started, primarily between Bradleys and enemy OPs and trench lines. Instructions were also issued that the damaged Bradley and Vulcan would be retrieved as well as a couple of other task force vehicles which had thrown their track.

Prior to contact, the 3/82 FA had re-positioned north of the border (Firing Position Sue) and was in position to support the fight. A number of missions were fired. Targets included several OPs, trench lines, an artillery battery and a mortar position. The closest enemy response was 4-500 meters from one of our firing batteries. The enemy fired in single rounds and failed to mass. The threat was insignificant, and we did not move any of our firing batteries in response.

When the task force commander ordered the withdrawal, the FIST were also withdrawn, leaving only the COLT, the TF FSO and the brigade FSCoord³⁶ as the three stations that could call for and adjust artillery. The FSCoord and TF FSO quickly corrected this and task force FIST re-positioned to support the recovery operations of the damaged vehicles. An effective smoke screen was fired to cover the recovery operations.

The brigade COLT and the Alpha Company FIST were credited with a number of effective fire missions and engaged enemy foot soldiers with machine gun fire. Four Bronze Stars for valor were awarded to Red Dragon soldiers for their actions during this

³⁶Fire Support Coordinator, the 3/82 FA commander.

fight.³⁷ The TF FSO, Captain Joe Gallagher, was very impressive in this action.

Recovery operations of the damaged vehicles was very time consuming, and it was almost dusk before they were completed. The battalion covered the task force withdrawal and was the last unit to cross the berm.

About one kilometer from the berm an M-1 tank struck a mine, losing several road wheels. Two soldiers were slightly wounded in the tank. The M-1 had to be abandoned in Iraq. An ambush force of M-1s guarded the downed tank from the Saudi side of the berm throughout the night, but the Iraqis made no attempt to capture it. The damaged tank was retrieved the next day. Ironically, the retrieval process was done incorrectly and the exhaust from a tank used to tow the damaged tank caused it to overheat and catch on fire. The damaged tank was completely destroyed.

Fortune had been on our side the day before when it was found that the task force had driven through a large minefield on it's return trip. A 3/82 FA soldier (Sergeant Knight) was slightly wounded when the tank in front of his track ran over a mine causing it to explode. His arm was injured from shrapnel.

The battalion's aid station was positioned perfectly to support and processed several of the wounded. Our medics performed extremely well with their first combat casualties.

³⁷1LT Skelton and SGT Reeder (COLT), 1LT Geduldig (FIST) and LTC Knight.

IRAQI FORCES' LOCATIONS & APPROXIMATE

STRENGTHS AS OF 22 FEB 91

ADNAN
RGFC

AL
BASRA
#

MADINAH
RGFC

HAMURABI
RGFC

15 MECH

26 MECH
76%

IRAQ

TAWAKALNA
RGFC

45 MECH

12 AR
65%

31 MECH
49%

28 MECH
49%

47 MECH
57%

48 MECH
49%

25 MECH
49%

27 MECH
48%

20 MECH

21 MECH

16 MECH

1 MECH
92%

29 MECH

7 MECH
45%

8 MECH
99%

5 AR

SAUDI ARABIA

MECH == MECH INF

AR = ARMOR

RGFC == REPUBLICAN GUARDS

ONLY DIVISIONAL UNITS SHOWN

NOT TO SCALE

KUWAIT

52 MECH
67%

17 AR
78%

10 AR
61%

53 AR
29%

3 AR
97%

6 AR
48%

11 MECH

"D" MECH

51 AR

KUWAIT
CITY

The battalion fired 536 artillery rounds during Operation Knight Strike. We were very pleased with the accuracy of these rounds as reported by the tanks and Bradley crews. Many of the rounds were fired "danger close" e.g., within 500 meters of friendly troops.

The maintenance posture of the battalion also continued to be outstanding. This operation was completed with no breakdowns.

The mood in the brigade was very somber that night and the next day. The brigade had been blooded - this was no longer just an adventure. The calmness of the troops and leaders under their first real test by fire was impressive, a tribute to good training.

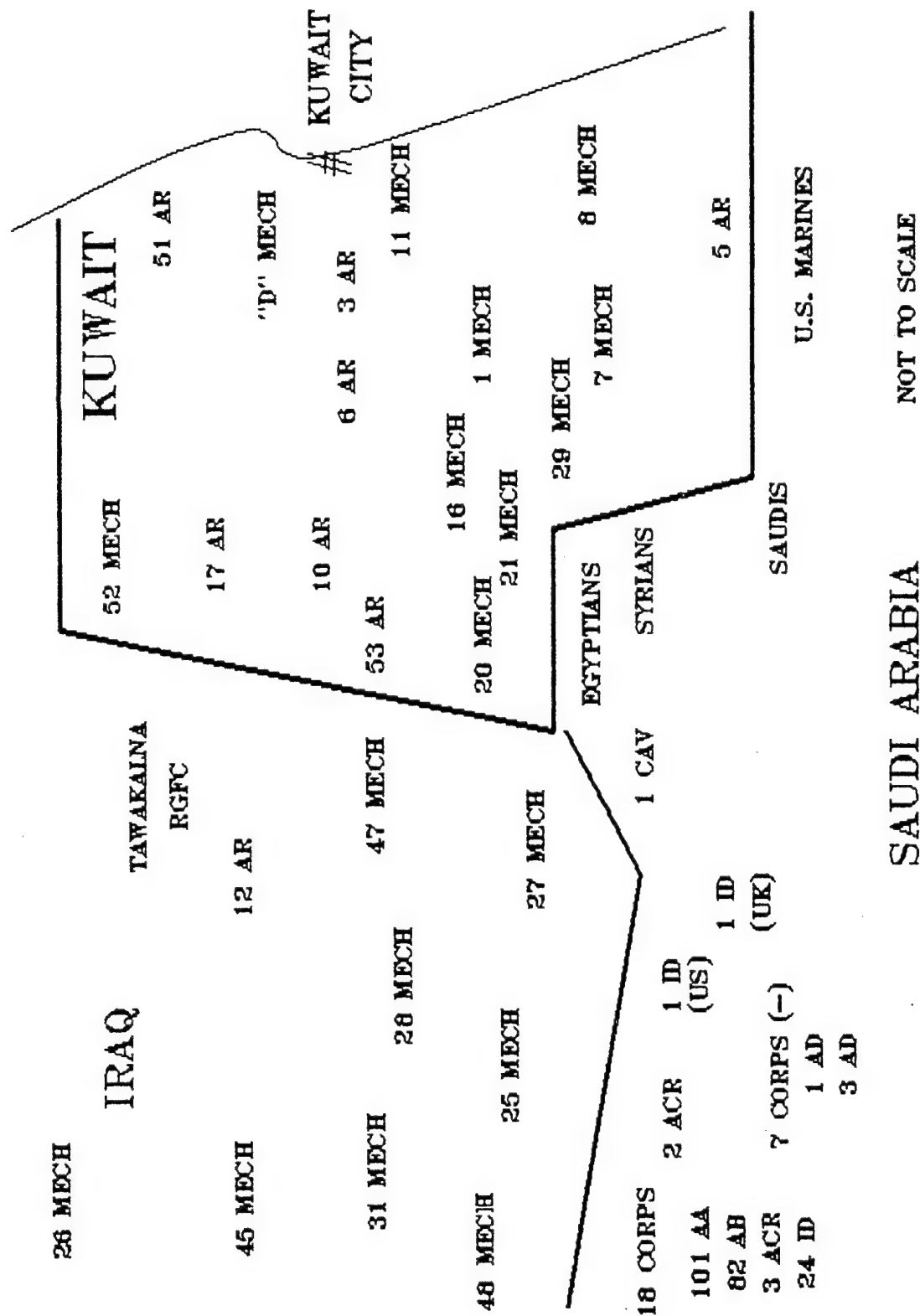
The battalion returned to its position in support of the 1-7 CAV. The 23rd of February was designated as a re-arm/re-fit day.

GROUND DAY, 24 February 1991

Ground Day started at 0400 on the 24th as VII Corps and XVIII Airborne Corps attacked to the west of us and the Marines and coalition to our east. The 1st Cavalry Division's mission was still to continue the deception and to act as theater reserve. A strong Iraqi position was to our front, and it was being reinforced, especially by artillery from the Republican Guard in response to our raids.

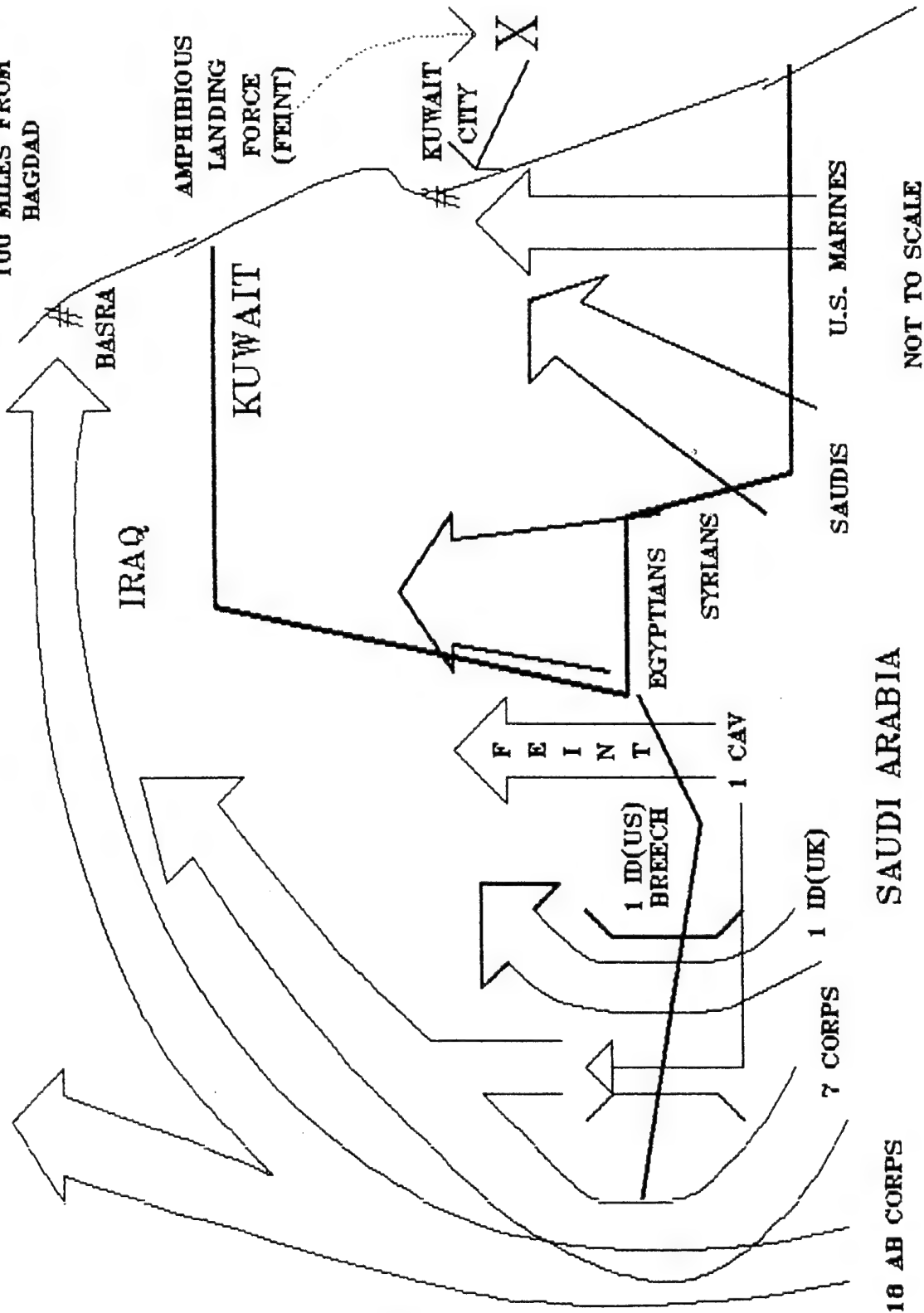
The battalion re-positioned to the north on ground day to support another artillery raid fired by DIVARTY between 1200 and

ALLIED FORCES' LOCATIONS AS OF 22 FEB

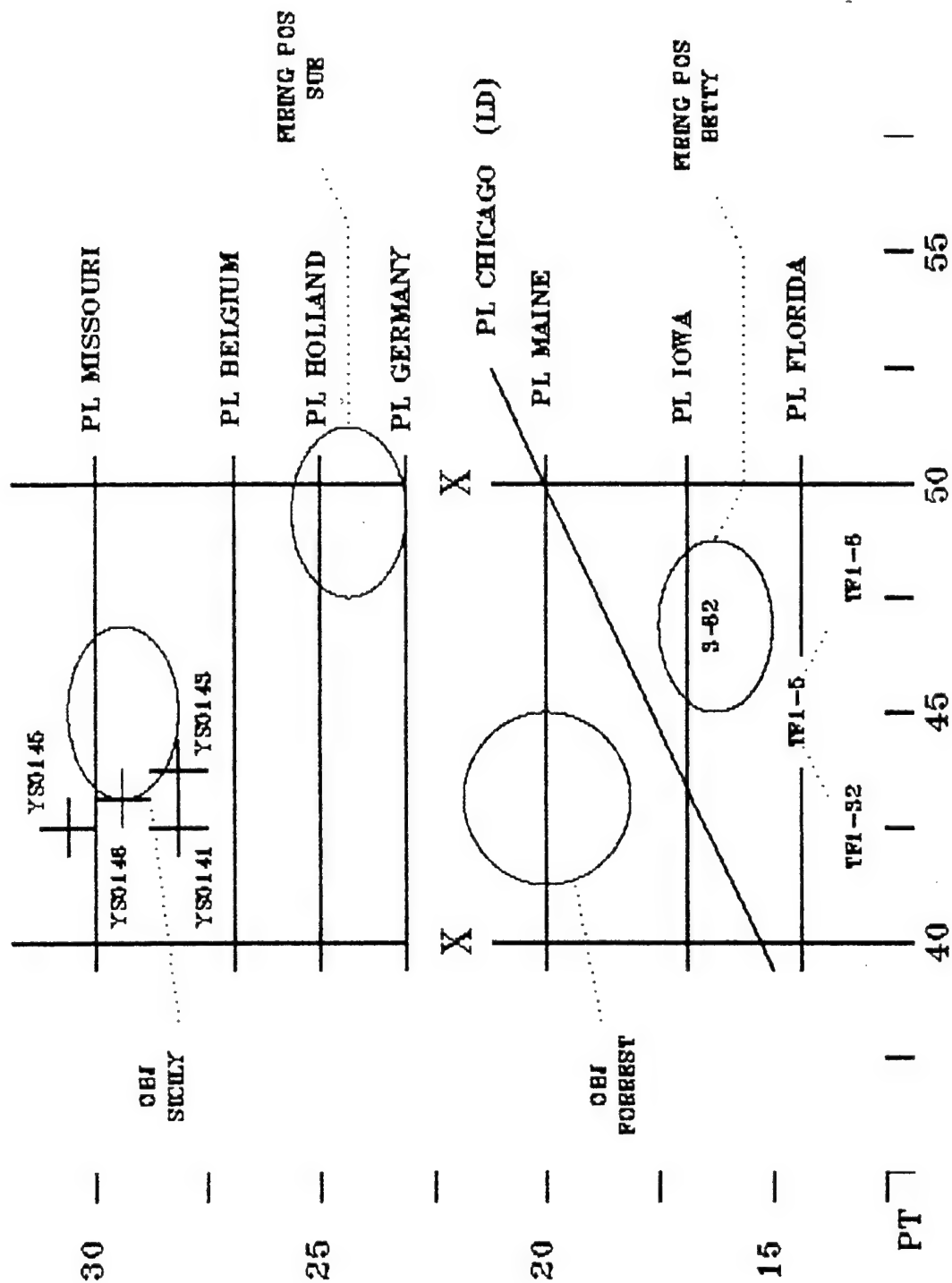


ALLIED FORCES' ATTACK PLAN

82ND AIRBORNE DROP
100 MILES FROM
HAGDAD



GRAPHICS AND FIRE PLAN FOR OPERATION QUICK STRIKE



1330. The battalion fired 867 DPICM³⁸ and 48 HE/VT rounds³⁹ during the operation.

While the Red Dragons were launching rounds into Iraq, the 2nd Brigade was finalizing plans for a brigade raid across the border. This would be the last deception aimed at the Wadi al Batin area.

OPERATION QUICK STRIKE, 24 February - 25 February.

The morning of 24 February was extremely confusing in the 2nd Brigade. A raid by TF 1-8 had been planned for that afternoon but was canceled. The brigade raid, codenamed Operation Quick Strike, had not been anticipated and would have to be executed "on the fly" with minimum planning or coordination.

Operation Quick Strike started at 1600 and developed into a very deliberate attack over the same ground that TF 1-5 had fought over during Operation Knight Strike. The 3/82 FA was repositioned well forward (after completing the DIVARTY raid previously mentioned) and supported the attack with a hastily planned preparation. We were credited with four kills, two artillery pieces and two APCs.

The brigade deliberately moved forward in brigade wedge formation with TF 1-5 leading. TF 1-32 was on the left flank and

³⁸Dual Purpose Individual Cluster Munitions, specifically designed to kill armored vehicles with air bursts.

³⁹High Explosive rounds with Variable Time fuzes designed to create air bursts. Very effective against troops in bunkers that are not protected with overhead cover.

TF 1-8 on the right. 3/82 FA did not move in the wedge but supported from occupied firing positions. When moves were required because of range, the brigade paused while we moved. The brigade command vehicles moved in our normal position behind the lead company of TF 1-5.

As darkness approached the brigade continued to move forward very slowly. The division was aware that reinforcements were pouring into our front and did not want us decisively engaged. The plan was for the brigade to establish a large show of force without becoming engaged, then withdraw and re-join the division for its march into Iraq through the breach being created by the 1st Infantry Division.

After moving eight kilometers, the brigade halted in place for the night. Between 2000 and 2200 an OH-58D helicopter lased four Copperhead rounds fired by 3/82 FA. These four rounds, fired by Bravo Battery, killed two tanks and one ZSU 23-4.⁴⁰ During the rest of the night the battalion fired numerous fire missions at OPs and trench lines. Numerous hits were reported by FIST and maneuver forces.

The battalion's ammunition section worked miracles re-supplying the firing batteries with red bag (longest range) ammunition and HE (high explosive) rounds which were proving to be very effective against trench lines. Howitzers at times were being re-supplied directly from the ammunition HMMETs instead of

⁴⁰Soviet made, track-mounted, radar controlled anti-aircraft weapon system.

their FAASV. We lost a number of windshields on our HMMETs from the tremendous concussions created by firing red bag ammunition.

At dawn on the 25th the brigade continued the attack. The brigade's mission was modified. The objective now was to try to find a soft spot in the Iraqi defense. If one was found, a decision would then be made whether or not to commit the division to a full scale attack to the north versus following the 1st Infantry Division through their breach to the west.

The brigade had continuous air support with at least a company of Apache attack helicopters over us continuously. Air Force A-10s were also in support. The attack was preceded by an artillery prep on suspected enemy air defense positions. As the brigade began moving forward TF 1-32 lost an M-1 tank to a mine. No soldiers were injured. The brigade captured 19 Iraqi soldiers at about this time.

As the brigade continued to approach the main Iraqi defense line, Bravo Company, 1-5 FIST killed two tanks with copperhead. Iraqi fire trenches⁴¹ were detected by the scouts and the Apaches. These were attacked with Apaches, artillery fires and A-10 aircraft. The trenches were set on fire and a tremendous smoke cloud rose up in front of us. Flames could be seen at the bottom of the cloud from two miles away.

At 0830 an Apache helicopter was shot down by enemy fire. The Apache was at fault because it strayed at least five

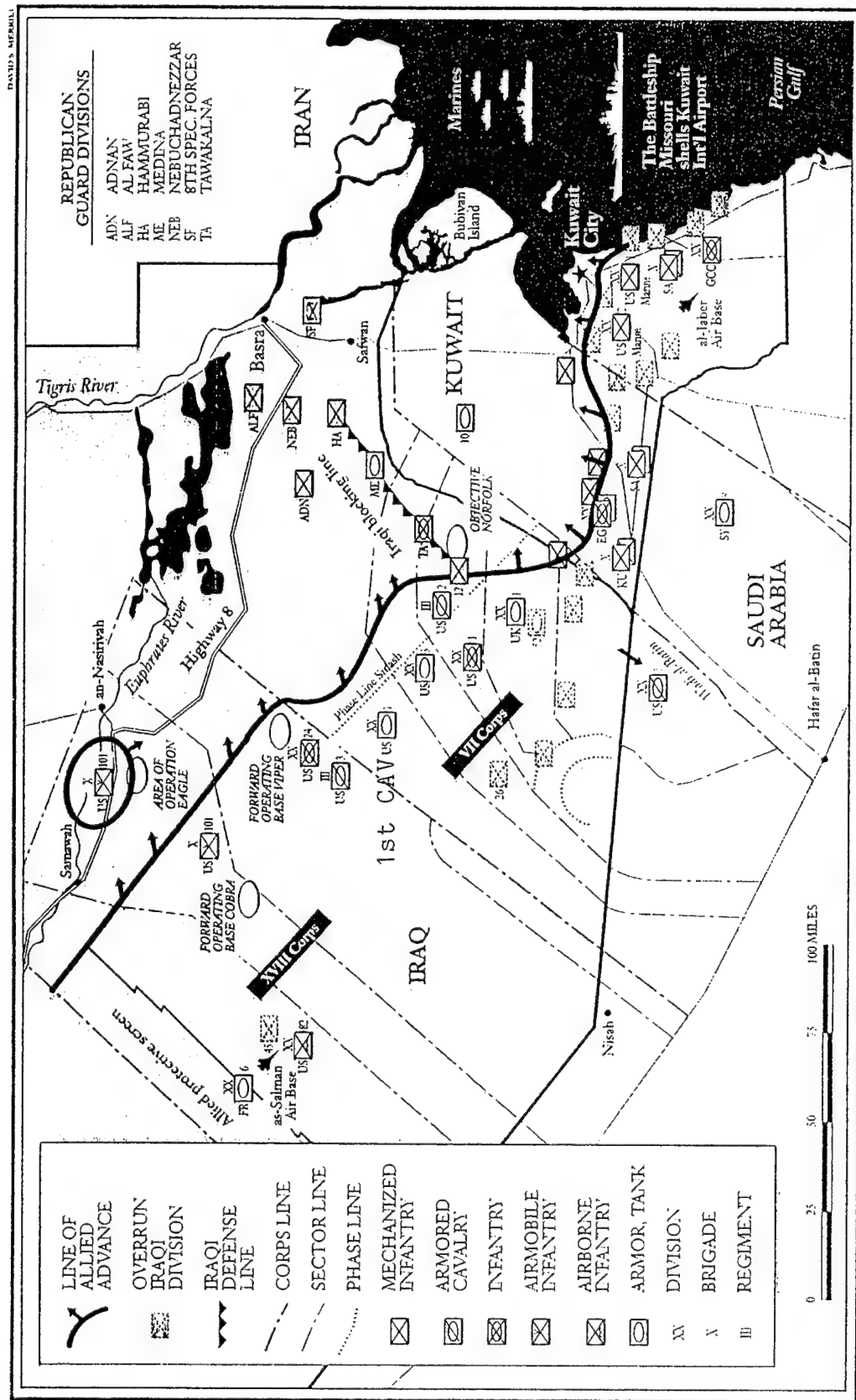
⁴¹Long trench lines that could be filled with oil and set on fire.

kilometers too far north and was beyond friendly cover. At great risk to themselves, another Apache landed and retrieved the crew of the downed helicopter. The brigade was ordered to make sure that the downed Apache was destroyed. We fired artillery at its reported position. The target could not be observed, and therefore, destruction could not be confirmed. TF 1-8 finally was able to maneuver a Bradley platoon within sight of the helicopter and destroyed it with a TOW missile. This operation took several hours because the exact grid location of the helicopter was not known, and it was very near formidable Iraqi defenses.

At 1230 it was determined that the defenses in front of the brigade were significant and would involve a major operation to breach them. The division commander ordered the brigade to withdraw and to re-join the division. The 1st Cavalry Division was ordered to move west and pass through the 1st Infantry Division and attack northeast.

After the war we learned that major reinforcements had been moved in by the Iraqis, who believed that the main attack was being conducted in our area. At least a corps artillery sized force was moved in. A division attack would have resulted in large casualties. The Iraqi forces that were to our front were isolated by the VII Corps attack and subsequent flanking move by the 1st Cavalry Division.

It had been a tough two days and one night. We had been in MOPP suits the entire period in anticipation of chemical attack. These suits were very exhausting to wear.



MAP 20

FEBRUARY 25, 1991: BY THE END OF THE SECOND DAY, ALLIED FORCES HAD TAKEN HALF OF THE KUWAIT THEATER

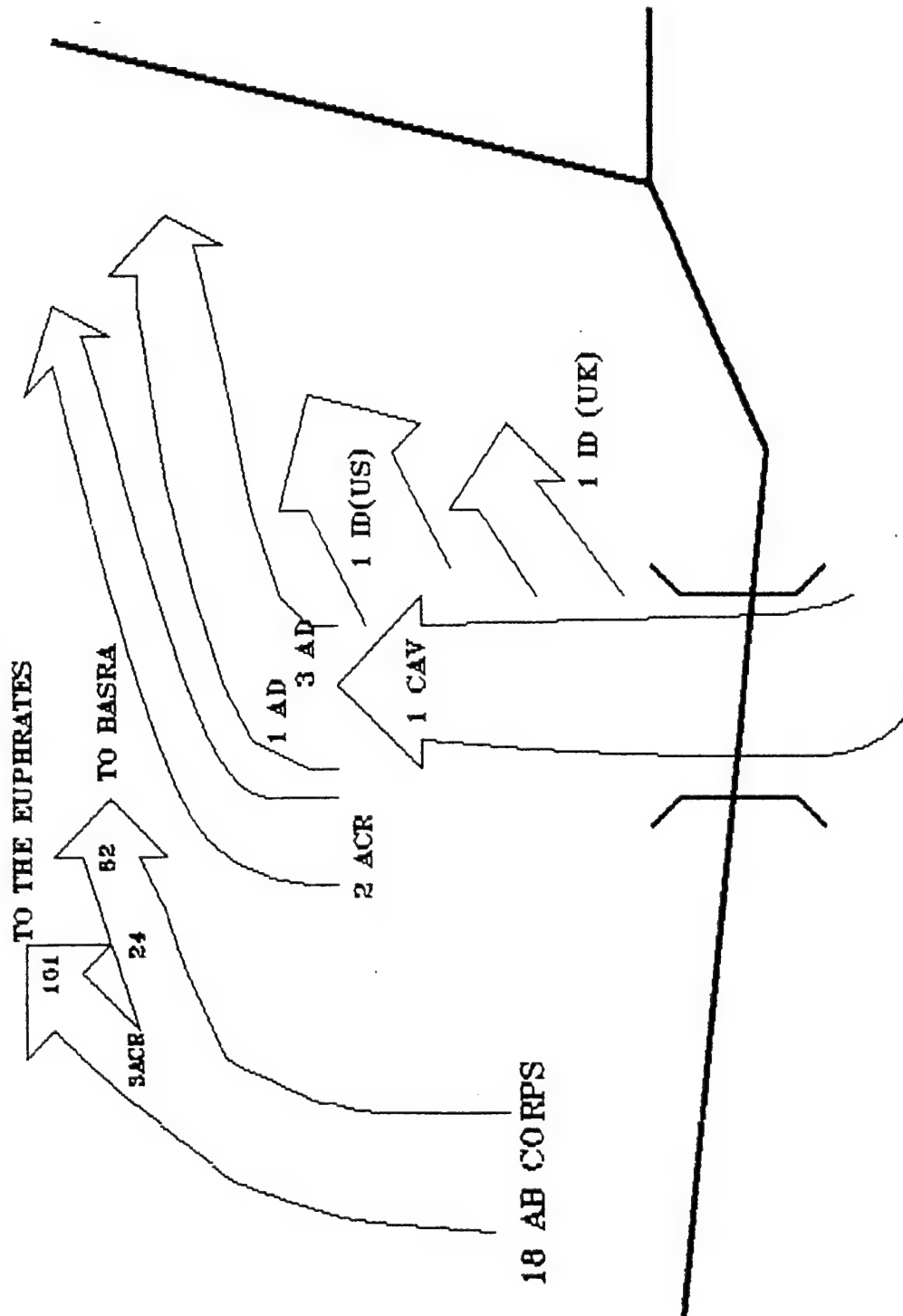
The brigade pulled back across the border at dusk. Several enemy vehicles were detected following the brigade. In response the 1-7 CAV was ordered to screen the rear of the brigade. We were directed by DIVARTY to leave a battery behind to support the 1-7 CAV while we continued on with the brigade into a TAA where we would prepare for a division move the next morning. Alpha Battery was selected.

The night was extremely dark, and it began to rain about 1900. Under the most difficult conditions imaginable, the battalion reacted as it was business as usual, re-fueling on the move and closing into the TAA at about 2230. Alpha Battery remained in support of 1-7 CAV all night. They were 11 miles away from the rest of the battalion, and they felt very isolated.

THE BREECH - 26 February 1991

We greeted the morning of 26 February with anxiety. The battalion had been stretched over the last few days, and we knew the division was probably only hours away from being committed to a major ground operation. Major Currid and his logistics staff did a super job of getting support up for the battalion. During the night the battalion had re-fueled and re-armed and vital maintenance had been performed. This readiness proved important. At 0800 we were alerted that the division would begin movement to the west at noon, pass through the 1st Infantry Division breach and attack north into Iraq.

THE ALLIED ATTACK



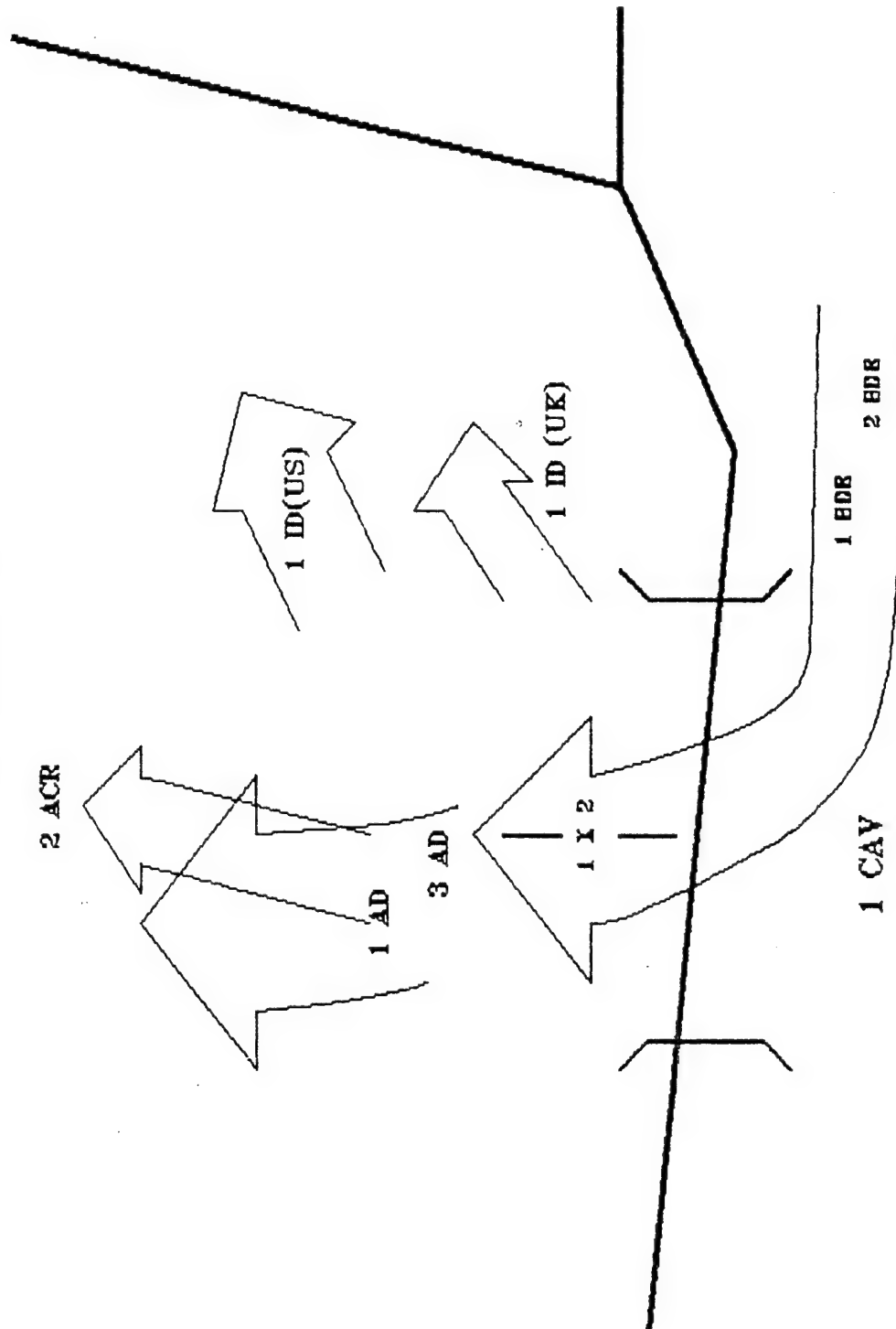
Our immediate concern was Alpha Battery which was still 11 miles away supporting 1/7 CAV. We were finally able to gain their release at 1030. The battery had been awake all night and had a long, tough drive ahead of them in order to join up with us in time. They would also require re-fueling when they arrived. Alpha Battery had a reputation for responding well to tough missions and Captain Batschelet arrived with his battery just as the brigade was pulling out.

The brigade lined up in eight long rows, bumper to bumper, by battalion. The 1st Brigade of the division did the same with 1-7 CAV in between. The brigade column started moving at 1245. It was impressive to watch this many combat and support vehicles moving at once. The desert was filled with moving vehicles from horizon to horizon. Because of the rainfall the night before there was little dust. The move was to be an administrative move until we passed through the breach since we owned the air and the breach site had been secured.

The 3/82 FA had the DIVARTY metro section, a Q-36 and a Q-37 radar section travelling with us. They had been with the battalion since 27 January.

After moving for several hours the division moved into a staging area just short of the breach. The brigade reached its area around 1630. In the staging area each battalion went through one of several 24 pump ROM (Refuel on the Move) sites set up by VII Corps. Each ROM site was set up at the entrance to a lane leading towards one of the many breaches made through the

2ND BDE, 1ST CAV MOVEMENT 26 FEB 91



Iraqi defense line on G-Day. TF 1-5, 3/82 FA, B-8th Engineers and the brigade main CP went through one ROM site together. The re-fueling of this group took about four hours.

At the ROM site I left my HMMWV with the brigade TAC CP (tactical command post) and joined the brigade commander in his M113. We joined TF 1-5 and followed their lead company through the breach at dusk.

The brigade re-assembled in attack position Blackjack and moved out in brigade wedge formation at 0030. We were headed for the VII Corp's Objective Lee, 50 km away, trying to catch up with the 1st Armored Division which proceeded us by 24 hours. The 1st Brigade paralleled the 2nd Brigades movement on our left flank but was out of sight several miles away.

27 FEBRUARY 1991

The brigade arrived at Objective Lee at 0330, refueled, and moved out at 0630 headed for Objective Horse 80 km away. After the breach site, the brigade formation was limited to tracked vehicles, HMMWVs and HMMETs, over 1,000 vehicles. Support vehicles followed miles behind in the field trains under the 15th Forward Support Battalion Commander, LTC Rich Kaye.

Our maintenance and fuel sections performed miracles at the fuel halts. When a vehicle broke down it was quickly repaired or towed to one of three maintenance collection points established by the XO and BMO (Battalion Maintenance Officer) 1Lt John Sipes.

An artillery battalion does not have enough fuelers to re-fuel at the same pace as an armor or mech infantry battalion. The brigade commander was under pressure to continue to move so only minimum time was spent at each halt. We would be re-fueling the last vehicle when the brigade would move out. The tankers would then have to re-trace the brigade's march route, link up with division tankers, re-fuel, and try to catch the brigade before we stopped again. They never failed, even in the dark and in the middle of enemy territory - a tribute to the great young soldiers, sergeants and officers in these sections.

At Objective Lee we left behind a howitzer from Bravo Battery due to maintenance problems and rolled out with 23 howitzers. Enroute to Objective Horse, the position of this objective was changed via radio call to 30 km north of its original position. This was of great concern since all of our fuel tankers but one had departed to re-fuel and were out of radio range.

About half way to Objective Horse we ran into a fire fight between the 2nd ACR⁴² and an Iraqi armored force. The division was instructed to keep moving and not become engaged. The brigade employed its smoke platoon which screened our right flank and we turned west, and then north, moving around the action.

The brigade arrived in Objective Horse at 1400. Our fuel tankers were being guided at this point by the battalion

⁴²2nd Armored Cavalry Regiment, the screening force for the VII Corps.

adjutant, Captain Chuck Schrankel. The XO and BMO were with the battalion maintenance section. Both they and Captain Schrankel were following far behind the brigade. Since both were out of radio range neither group knew about our change in direction or the 2nd ACR fight. Miraculously, the battalion XO picked up a long range radio call and was able to divert our maintenance assets. Captain Schrankel was able to monitor the same call but could not acknowledge the call. There was great relief in the battalion when he arrived with the fuel tankers a few minutes after the brigade halted.

Enroute to Objective Horse both the 1st and 2nd brigades lost contact with the division commander. Both brigade commanders were in contact with each other and continued with the plan. Intelligence reports were sketchy and the brigade commander was often unsure about the situation to our front. Both of the brigade's command posts, the main TOC and the TAC, were on the move. Therefore, this normal link to the division was not available. Finally, the division commander abandoned his command M113 and raced ahead in a helicopter. From his helicopter he was able to communicate with the two brigade commanders and command the division.

At Objective Horse I was contacted by the battery commander from 1/158 FA. He commanded an MLRS battery from the Oklahoma National Guard that had been sent by DIVARTY with a reinforcing mission to us. We had not been able to communicate with DIVARTY since crossing the border so this reinforcement was unexpected.

The MLRS battery had literally unloaded at the port and driven to war. They had only been in-country for two weeks. They arrived at Objective Horse after having been in a fight and almost overrun. I immediately was impressed by the professionalism of their commander on the radio. He had shown great leadership in just being able to find us.

Our biggest problem was that he arrived on empty fuel tanks and 10 minutes from our scheduled time to depart Horse. Our three fuel tankers were barely adequate to re-fuel the 3/82 FA and were empty by now. Initial reports indicated that the other fuel tankers in the brigade were also about out of fuel. I could not believe that we were going to have to leave such a valuable asset as an MLRS battery behind to wait on fuel. I called Major Currid about the problem and left it in his hands. Once again this master logistician worked a miracle. Commandeering two fuel tankers from one of the task forces (who did not seem to know they were available) the XO led them to the MLRS battery. They were refueled in about 45 minutes and quickly caught up to the brigade formation.

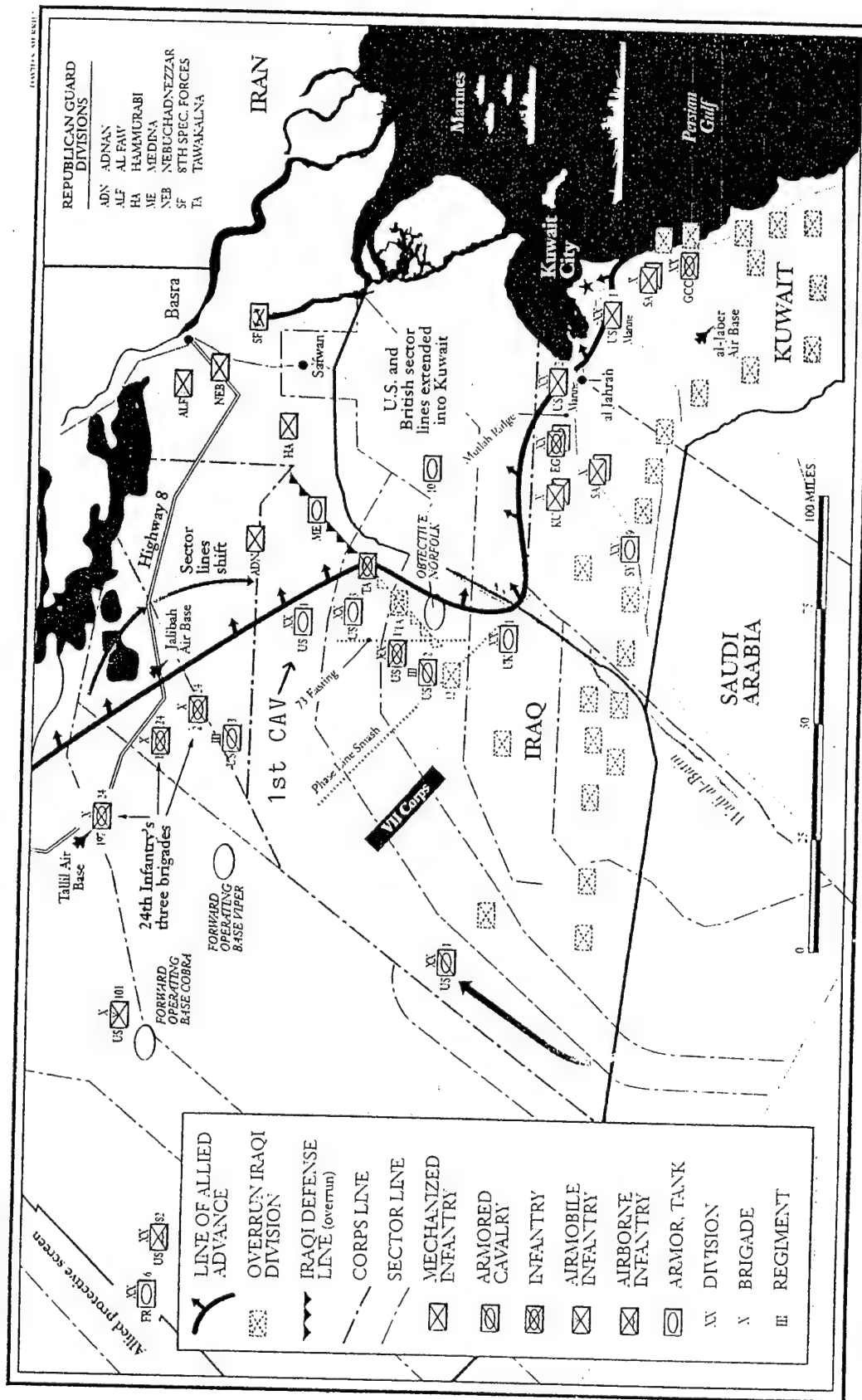
In Horse we confirmed that we were now in a race to encircle the enemy as he attempted to withdraw northeast towards Basara. During the two and one half hours that we were in this position the brigade received three mission changes. Finally, we were told to move at 1630, pass through the 1st Armored Division and attack the Hamurabi Division of the Republican Guard.

The brigade S-3 moved up to the brigade commander's M113 from the brigade TAC and the other battalion commanders were called in. A quick set of graphics were drawn on the hood of the brigade S-3's vehicle. I was able to get Major Johnson, our S-3, forward for the meeting. He was the only battalion S-3 to make it. New graphics were passed over the radio to the rest of the brigade, a very difficult thing to do. I was able to confer face-to-face with the S-3 so commander's intent was a little easier to understand in 3/82 FA than in the other battalions.

We were only in intermittent contact with the brigade FSO, Major Barron. Since the brigade main TOC was on the road we were not able to get any targeting information from him. It appeared that we would be doing a movement to contact operation and would have to process targets as they appeared versus firing any preparatory fires.

At 1630 we moved out on a 70 - 80 km march to our next objective. The distance was vague because we did not have exact locations of the 1st Armored Division. Just prior to dusk we began to see evidence of fighting. Several bunkers and some destroyed Iraqi equipment was passed. The scouts and the lead company of TF 1-5 began to take Iraqi soldiers who were surrendering.

Finally, around 2000, the brigade came into contact with 1st Armored Division. It was extremely dark by now, and the division was having difficulty communicating with the 1st Armored Division. The 1st Armored was in contact with Iraqi forces



FEBRUARY 26, 1991: ON THE THIRD DAY, VII CORPS WHEELED TO THE EAST TO ATTACK THE REPUBLICAN GUARD

immediately to our front. Rather than risk fratricide in the dark trying to pass through the 1st Armored Division, it was decided to halt the 1st Cavalry Division in place until morning. The 1st Armored would make a limited attack at first light, and then we would pass through them. Our mission was to close the door on the Iraqi escape route north.

Everyone welcomed the halt. The brigade had just completed a movement of 175 miles in 48 hours. Most soldiers had not had any sleep for two days and two nights.

The first priority, however, was to re-fuel and close everyone in. I was amazed that our tankers were back with us, and we were soon re-fueled. We had lost six or seven vehicles due to maintenance problems but the XO, BMO and Maintenance Tech, CW2 Martinez, knew exactly where these vehicles were and had collected them in collection points. There were enough soldiers at each to provide security, and they had food and water.

This organized maintenance plan was not repeated in most other units unfortunately. Several of the battalions that dropped vehicles did not find them for several days. Otherwise, the division was in great shape - re-fueled, armed and at 98% vehicle strength, an unbelievable accomplishment.

The evening of the 27th was confusing. We finally made contact with the brigade FSO but there was not enough intelligence to develop a fire plan for the attack planned the next morning. Attempts to contact the 1st Armored artillery units to our front for information were unsuccessful.

28 FEBRUARY 1991

At 0525 we were told that a cease fire was to go into effect at 0800. Shortly after, at 0530, a 10 minute artillery prep was fired by the 1st Armored DIVARTY. This was an awesome display since their artillery battalions and MLRS batteries were to our immediate front and flank. The 0600 planned attack by the 1st Armored was called off as well as the 1st Cavalry's 0900 attack.

As dawn arrived we discovered that we were surrounded by the face of war. We had stopped in the middle of where the Tawakalna Division of the Republican Guard had fought and died. Iraqi vehicles and bunkers were everywhere. There was also unexploded U.S. ordinance everywhere. The night before the brigades liaison officer to the division had run over a dud just behind the brigade commander's M113. He lost the right front tire on his HMMWV. Lying everywhere were Air Force CBUs (cluster bombs) and MLRS DPICM bomblets.

It began to appear to us that the war might be over. My HMMWV had caught up to me during the night and at 0900 I drove back to the 3/82 FA TOC. We had been extremely lucky during the evening. Our re-fuel operations, conducted in nearly zero visibility, had been only a few feet away from unexploded CBUs. As I drove around through all of this I was amazed that over 1,000 vehicles had driven through this maze unscathed.

At noon I re-enlisted SFC Wright, a platoon sergeant from Charlie Battery. He wanted to re-enlist in Iraq. I am sure he was the first soldier to do so.

While the re-enlistment was occurring, I received word that a soldier from Alpha Battery had stepped on a dud. Pfc Roger Valentine was evacuated to the Combat Trains where our surgeon, Dr. Jerry Karr. and our medics did everything they could to save him. A few minutes later he was evacuated by helicopter to a MASH. He died of wounds at 2330 that night. Ironically, Pfc Valentine died because he did the right thing. He was walking from his howitzer to the fire direction center when he stepped on a MLRS DPICM dud.⁴³ This munition was very difficult to see and blended in well with the small rocks prevalent in the area. When the munition exploded, a piece of shrapnel ricocheted off the inside of Pfc Valentine's helmet, striking him in the forehead. He was wearing flak jacket and helmet properly and should have been protected. Over the next few weeks the division would lose several more soldiers, killed or wounded, to duds. Most were casualties because they were not in the proper uniform or were mishandling the ammunition.

A memorial service was held for Pfc Valentine on 2 March in Alpha Battery's location. Brigadier Generals Tilelli, Franks and Robles, and Colonels House and Gass were in attendance.

During the next few weeks the battalion stayed in this position. Initially there was great concern about Iraqi units attempting to move north out of the enclosed allied pocket. A few hours after the cease fire the division was instructed to let

⁴³MLRS DPICM duds were black and the size of a 12 gauge shotgun shell.

enemy units pass. At least one large armored column passed through the division near the DIVARTY TOC location causing that element to displace rather than risk a confrontation. Tension was high during this period. The order was later reversed, and we told that Iraqi units must either surrender or be engaged. While no other units passed through the 1st CAV area they did through other units to our flanks. There were some additional fights as a result. An Iraqi brigade sized force was destroyed to our immediate north when they refused to surrender. This occurred several days after the cease fire.

Our first priority after the cease fire was to recover our downed maintenance vehicles. We had five or six vehicles that had broken down on the route of march, including two howitzers. As previously mentioned, the XO knew exactly where they were and had crews with them. Within 12 hours both howitzers were up and had rejoined the battalion. The remainder closed within 24 hours. This was an incredible achievement and a tribute to both the maintenance sections and the vehicle crews. Many battalions were still searching for downed vehicles days later.

The battalion had fired 3529 artillery rounds. We would learn later that this was the most rounds fired by any artillery battalion in theater. There were many factors that contributed to this, including our opportunity to participate in border raids. But just as important was the battalion's movement and occupation techniques, crew drill and the ability to locate targets by the FIST.

We were given the mission of destroying Iraqi equipment over a large section of the brigade's area. We gave each battery an area to cover. During this operation a large amount of Iraqi equipment was collected for its intelligence value and as individual and unit war trophies. The destruction mission was dangerous because of the previously mentioned unexploded ordnance as well as Iraqi minefields that were in the area.

There were also Iraqi soldiers still in some of the hundreds of Iraqi bunkers that surrounded us. On 2 March a detail from Charlie Battery, under the command of First Sergeant Pape, captured six prisoners in a bunker. One Iraqi refused to leave the bunker and was persuaded out by a smoke grenade. Unfortunately, he inhaled too much smoke and later died at the brigade's POW collection point.

We learned a lot from observing the effects of air bombing on prepared positions. It was evident from the amount of craters, duds and expended CBU canisters that the Tawakalna Division had been heavily bombed. Most of the bunkers survived intact unless they received a direct hit, and we saw few of those. The same was true of equipment, although many of the smaller wheeled vehicles had been literally picked up and thrown on top of their reveted positions. The real impact that the bombing had was on the soldiers themselves. Based upon the amount of abandoned equipment and vehicles it appeared that the bombing must have impacted heavily on their morale and will to fight.

The most significant air damage that we observed came from A-10 planes and Apache helicopters. We also saw a large number of T-62 and T-72 Iraqi tanks that had been destroyed by M-1 tanks from the 2nd Armored Cavalry Regiment (now famous Battle of 73 Easting). The Iraqi tanks were normally catastrophic kills, e.g., turrets blown off, hulls completely burned, etc. We saw two M-1s that had been hit. One was still operational. Another was destroyed (from friendly fire) but its integrity was still intact.

Captain Skip Larsen, Bravo Battery Commander, discovered an abandoned 2S1 artillery battalion⁴⁴ intact. This was a tremendous find for an artilleryman, and we spent several days exploring the area before the vehicles were destroyed. We recovered a howitzer complete with its section equipment, and it is currently on display at the 1st Cavalry Museum at Ft. Hood, Texas. The howitzer belonged to the 2nd Battery, 146th Brigade, Tawakalna Division, Republican Guard. SFC Perrin, Bravo Battery, SFC Wright, Charlie Battery and CSM Tolleson were instrumental in recovering the howitzer. SFC Perrin was in charge of escorting the vehicle back to Saudia Arabia. The howitzer was transported back on a low boy truck in a convoy supervised by the division. When the truck broke down inside Iraq, SFC Perrin refused to abandon the howitzer. Instead he and his detail drove the howitzer over 100 miles back into Saudia Arabia, flying an

⁴⁴152mm self-propelled, Soviet made howitzer. The primary medium range Soviet artillery.

American flag from the turret as a recognition signal. SFC Perrin put more miles on the howitzer than its original Iraqi crew.

We remained in Iraq until mid-March. Life was very spartan as we were located over 200 miles from our main logistics base.

On 8 March we sent 30 soldiers back to the states as an advanced party. Major Barron and 1SG Harwood were in charge. Their mission was to re-open our barracks and get things at home ready for us. With their departure the battalion knew that going home was now in sight.

A few days later the brigade retraced its long march into Iraq in an impressive fashion. The four combat battalions moved cross-country in four long columns abreast. Only tracked vehicles and HMMWVs were in this group. A fifth column with the wheeled vehicles and field trains moved back via a less direct road network. The road march took two days with the brigade closing into its assigned area, TAA Killeen, at 1500 on day two. TAA Killeen was located just north of Hafir al Batin near where we had been located in early January.

The battalion dropped a few vehicles but as usual the soldiers performed miracles getting them recovered. All of our vehicles closed into TAA Killeen by 2200 the same evening. It took the brigade several days before all of their equipment made it.

Upon arrival at TAA Killeen, the brigade battle task force was dissolved, and we reverted back to DIVARTY control.

RE-DEPLOYMENT - 19 MARCH - 20 APRIL 1991

A few days before we departed Iraq I sent CSM Tolleson and all the first sergeants back to Saudia Arabia as an advanced party for the battalion. They were able to obtain wooden latrines, showers and some tents. Our stored equipment from TAA Wendy was retrieved although a considerable amount had been subjected to pilferage. We were even issued a refrigerator trailer.

The entire DIVARTY (minus 1/3 FA, DS to Tiger Brigade) assembled together in TAA Killeen. We stayed here until 6 April. Time was spent repairing, cleaning and accounting for equipment. Our ammunition was collected and turned in. We were warned that customs inspections of both unit and personal equipment would be tough so we spent considerable time preparing for this.

Quality of life was very good here. We were issued Class A rations and had our first sustained period of hot meals. We were able to scrounge six German manufactured shower trailers similar to the ones we had liberated from the Syrians in January, so hot showers were available. The division re-established phone calls home and a PX and post office were once again available.

MG Tilelli (promoted in April) addressed the battalion while we were in this location. We also formed with the division to hear LTG Franks, VII Corps commander, address us.

On 5 April we dismantled our camp in preparation to move to the port. The local Bediouns were very bothersome during this

period. They surrounded our camps picking up anything that was thrown away. We gave them a large amount of food and other expendables that would have normally been destroyed.

On 6 April the DIVARTY departed for Dhahran in several long convoys. Tracked vehicles were transported on low boys, and the wheeled vehicles drove the 250 miles to the port. Convoys started departing at dawn and the last Red Dragon vehicle closed at 0130 with the XO bringing up the rear. We only dropped a couple of vehicles for maintenance and those were easily recovered. Our advanced party, led by Major Johnson and CSM Tolleson, did a super job of preparing for us, and we found our way into the staging area with virtually no problem.

Vehicles coming in from the desert were staged in Khobar City, just outside of Dhahran. Two large wash racks had been established, one at Khobar for tracked vehicles and the other at the military airfield at Dhahran. There was a large waiting line, managed in brigade sets. DIVARTY's turn was several days away.

Our living quarters were superb, especially when compared to the warehouse that we had occupied when we first arrived. We were housed in Khobar Towers, a huge, German built condominium like complex. It had originally been built for Bedouins in 1980, but never occupied. We were assigned several apartments for the battalion. The apartments were located in six and eight story buildings and they were huge. Each had five or six large bedrooms, several bathrooms, a kitchen and they were airconditioned.

We were fed very well in contract mess halls and there was a PX, movie area, shopping arcade, fast food arcade, barber shop, telephone area, etc.

During the few days we had here soldiers were allowed to go into Khobar City to shop. Soldiers had to be escorted by a sergeant first class or above because of the sensitivity of the Saudi culture and religion and because the Ramadan⁴⁵ season, one of their most holy periods, was just ending.

On 13 April the battalion took the wheeled vehicles through the wash rack and cleared customs, a 24 hour operation from start to finish. On the 14th, after only a short rest break, we did the same thing with our tracked vehicles, finishing this operation in a record 16 hours.

On 19 April we finally started for home. The S-3 and CSM led the first group consisting of Alpha and Bravo Batteries and one platoon from Charlie Battery. The XO and I led the remainder of the battalion a few hours later.

The welcome that we received at home was tremendous. The 1st Cavalry band greeted us on arrival at Hood Army Airfield at West Fort Hood. On the 10 mile route between the airfield and main post many civilians waving flags lined the road and a radio station was set up broadcasting live from a remote van. At Abrahms field house an overflowing crowd of family and friends welcomed us home. Our second flight, with HHB, Service and part

⁴⁵The ninth month of the Muhammadan year observed as sacred with fasting practiced daily from dawn to sunset.

of Charlie Battery, arrived at 0500 on the 20th after some delays enroute. The welcome home was just as enthusiastic by the people in Killeen despite the early hour.

Thus ended the great adventure. The Red Dragons were home.

KEY POINTS/LESSONS LEARNED - OPERATION DESERT STORM

1. There is no substitute for good leadership, especially at the small unit leader level. Often lieutenants and sergeants were responsible for independent operations or found themselves outside the supporting range of the battalion. This was particularly true with our maintenance and supply sections, which were also disadvantaged by the lack of sophisticated navigation devices and adequate radios. Almost without exception, the leaders in these sections were focused, mission oriented and excelled. They are a tribute to the Army's leadership schools and leadership philosophy.

2. The National Training Center (NTC) prepares heavy forces for war. It was common place after a battle to compare it to previous, similar experiences at the NTC. Soldiers knew what to do in battle because they had experienced it in training.

3. Always keep soldiers informed. Soldiers thirst for news. We are in an age where instant updates are expected. Even though most soldiers were able to listen to radio broadcasts, these were often wrong, exaggerated or not applicable to us. During Desert Shield the CSM and I spoke to each battery often in order to keep them informed of the latest news. We did the same

thing during Desert Storm, often using a map to show them where we were. Within hours of the cease fire I began travelling to each battery and the combat and field trains to brief soldiers on the situation. This was not to take away from the battery commander but to add to what he had already told them. There also seemed to be a desire by the soldiers to hear the latest news from the battalion commander and the command sergeant major.

4. Always tell soldiers the truth. There were many times when information was classified. When we could not tell them something we explained why rather than distort the truth.

5. Mail is extremely important. Soldiers will give up hot meals, showers and many other creature comforts in order to receive mail. It is one of the most significant morale boosters, especially during combat operations.

6. The family support program is extremely important. During combat it serves as a surrogate family for those left back home. The command cannot ignore the program during combat and must make every effort to keep families informed.

7. Before combat begins a well researched and staffed theater war trophy policy should be published. Once established, it should not change. Based on our location the Red Dragons retrieved a significant amount of unit and personal war trophies. The rules prescribing what was allowed continually changed. Items once acceptable would become prohibited. The battery commander would collect the prohibited item and destroy it, only to find it acceptable again a few days later. This became a

significant, emotional morale issue. Soldiers who had lived in the desert for seven months, with almost no contact with the locals, viewed war trophies as their only souvenir of the experience. The division was attached to VII Corps in Iraq and back to XVIII Airborne Corps upon return to Saudia Arabia. Each corps had a significantly different policy concerning war trophies which contributed to part of our problem. At the port we were confronted with several different teams of customs inspectors. Each team seemed to have their own interpretation of what was allowed and what was not. In the future there needs to be a theater policy established that applies to all units.

EPILOGUE

On 30 May 1991 the Red Dragons hosted a Dining In at the Officer's Club at Ft. Hood. All sergeants and above were in attendance, and the honored guests were Colonel Gass and Colonel House. During a ceremony featuring the battalion's senior leadership, our silver punchbowl was christened the "Valentine Bowl" in memorium of PFC Roger Valentine, our only casualty during the war.

APPENDIX A

3RD BATTALION, 82ND FIELD ARTILLERY

RED DRAGONS

BN CDR: LTC KENNETH R. KNIGHT
BN CSM: CSM GORDON C. TOLLESON III

BN XO: MAJ DAVID W. CURRID replaced MAJ JERRY SNELSON, NOV 90
BN S-3: MAJ FREDRICK E. JOHNSON JR.
BDE FSO: MAJ MICHAEL C. BARRON

BN S-1: CPT CHARLES R. SCHRANKEL
ASST S-1: 1LT JOHN E. FRANCIS
PSNCO: SFC RICARDO PARRIS

BN S-2: CPT BURL W. RANDOLPH JR.
INTEL NCO: SFC RICHARD PHILLIPS
ASST S-3: CPT JEFFRY L. BURBRIDGE
ASST S-3: 1LT CLINTON MCCREA III

BN OPS SGT: MSG MICHAEL M. HIGA
ASST OPS SGT: SFC DAVID B. PARKER
ASST OPS SGT: SFC EDGARDO RIVERA

BN S-4: CPT JOSEPH T. MORRIS
S-4 NCOIC: SFC FRANCISCO ENCARNACION
BN FDO: CPT TODD R. LIETHA
ASST FDO: CPT JOHN H. HAMLETTE JR.
BN CESO: CPT LEITH A. BENEDICT
BN CHEMAO: 2LT MARK FRAHM
BN MAINT OFF: 1LT JOHN T. SIPES

CHAPLAIN: CPT MARK YATES

SURGEON: CPT JERRY KARR

3RD BATTALION, 82ND FIELD ARTILLERY

RED DRAGONS

HHB CDR: CPT GREGG E. ANDERLE
HHB ISG: 1SG ROBERT D. KNIGHT JR.
HHB XO: 1LT EDWARD J. ALCOCK
COMMO PLT LDR: 1LT BOBBY R. WILLIAMS
COMMO PLT SGT: SSG CALVIN L. CASWELL
SURVEY NCOIC: SFC PAUL M. ANDROSKI

MOTOR SGT: SFC WHITTAKER

BDE TGT OFF: CPT BRADFORD E. DEAN
BDE TGT OFF: CPT DAVID S ELLIOT
BDE FSNCO: SFC CALVIN S. TURNER
BDE COLT: 1LT JAMES A. SKELTON

TF 1-5 FSO: CPT JOE E GALLAGHER
TF 1-5 TGT OFF: 2LT ORLANDO M. DELGADO
TF 1-5 FSNCO: SFC JOE L. WOODS
A/1-5 FSO: 1LT AARON L. GEDULDIG
B/1-5 FSO: 1LT JEFFREY NORTHINGTON
C/1-5 FSO: 2LT GERARDO R. DIAZ
D/1-5 FSO: 2LT JOHN J. DRISCOLL

TF 1-8 FSO: CPT GERALD L. BELL
TF 1-8 TGT OFF: 2LT BRADLEY A. GARNER
TF 1-8 FSNCO: SFC JULIO TORRES
A/1-8 FSO: 2LT MARK S. KREMER

3RD BATTALION, 82ND FIELD ARTILLERY

RED DRAGONS

B/1-8 FSO: 2LT VANNARETH KEOMOUNGCHANH
C/1-8 FSO: 2LT THOMAS A. DEVINE
D/1-8 FSO: 2LT THOMAS F. MOORE

TF 1-32 FSO: CPT TIMOTHY C. WOODS
TF 1-32 TGT OFF: 2LT JOHN KNIGHTEN
TF 1-32 FSNCO: SFC ELLIS R. HAWKINS
A/1-32 FSO: 1LT SHELDON L. BULLOCK
B/1-32 FSO: 1LT CRAIG R. PATTERSON
C/1-32 FSO: 2LT GREGORY FRANCO
D/1-32 FSO: 1LT WILLIE R. WITHERSPOON

A BTRY CDR: CPT ALLEN W. BATSCHELET
A BTRY 1SG: 1SG GARY R. NEEL
1/A PLT LDR: 1LT RICHARD E. BAXTER
1/A FDO: 1LT EDWARD B. LOWTHAR
1/A PLT SGT: SFC JOHNNY L. ANDERSON
2/A PLT LDR: 1LT MARK A. CHARETTE
2/A FDO: 1LT SCOTT D. LINGLE
2/A PLT SGT: SFC BILLY G. SCROGGINS

MOTOR SGT: SFC MURRELL, TODD

3RD BATTALION, 82ND FIELD ARTILLERY

RED DRAGONS

B BTRY CDR: CPT HENRY S. LARSEN
B BTRY 1SG: 1SG MICHAEL L. WALKER
1/B PLT LDR: 1LT GARY W. DITTERLINE
1/B FDO: 2LT AUSTIN KEATON JR.
1/B PLT SGT: SFC ELIJAH KING JR.
2/B PLT LDR: 1LT GREORY A. OLSON
2/B FDO: 1LT JEFFERY G. STANSEL
2/B PLT SGT: SFC BILLY J. BOONE

MOTOR SGT: SFC PAUL THOMAS

C BTRY CDR: CPT RONALD A HOSKINSON
C BTRY 1SG: 1SG JAMES D. PAPE
1/C PLT LDR: 1LT JAMES A. KEARSE
1/C FDO: 1LT PATRICK R. NUGENT
1/C PLT SGT: SFC PHILLIP J. WRIGHT
2/C PLT LDR: 1LT JOHN L. MARTIN
2/C FDO: 2LT EDWARD C. NORMANDIN
2/C PLT SGT: SFC EDWARD A. RAMIREZ

MOTOR SGT: SFC ROY WOODS

SVC BTRY CDR: CPT JEFFREY G. KOZLOVICH
SVC BTRY 1SG: 1SG LARRY J HARWOOD JR.
BN AMMO OFF: 1LT HENRY A. KELLY JR.
AMMO PLT SGT: SFC GEORGE E. MCDOWELL
BN MAINT TECH: CW2 PEDRO MARTINEZ
BN MOTOR SGT: SFC KEVIN M. MCKELLAR

replaced CPT GEORGE
ALLEN, 1 DEC 90

APPENDIX B

1st Cav Div Arty

Reports from Operation Desert Shield

by Colonel James M. Gass



Colonel Gass, Commander of the 1st Cavalry Division Artillery, wrote this article in early December 1990. His Division Artillery has been deployed in Operation Desert Shield since late September.

During the 1st Cavalry Division's deployment and initial training period on Operation Desert Shield, we have developed, rediscovered and experimented with a number of different tactics, techniques and procedures. At this point, our analysis of the situation and the factors of mission, enemy, terrain, troops and time available (METT-T) lead us to believe that these adaptations will substantially improve our efficiency—and survivability—in the desert.

This article briefly discusses several such techniques as well as considerations for operating in the desert environment.

Maps. Units are operating in very open terrain with few discernible terrain features that can be identified on a map. The maps have large, open spaces with little relief. The actual terrain has significant features not depicted on the map. Much emphasis is placed on "dead reckoning" using compass, odometer and, when available, navigational aids such as the small, lightweight GPS receiver (SLGR) and the long-range aid to navigation (LORAN). Training is required on the use of latitude/longitude for navigation and fire-mission processing. Units also must be familiar with converting latitude and longitude to universal transverse mercator/military grid reference system (UTM/MGRS) and plotting latitude and longitude on military maps. When using UTM/MGRS, units must be able to use the complete 13-digit coordinates.

Given the severe shortage of maps, units must operate with a significantly reduced number of them. They must be able to operate using 1:250,000 scale maps as the standard due to the large distances they'll encounter. In the digital/tactical fire direction system (TACFIRE), long coordinates are the standard as division zones encompass two or three 100,000-meter grid squares.

Rates of Movement. Due to mobility constraints, TACFIRE shelters may not be able to keep up with units' rates of march. As a result, we're training to operate in "digital off" mode. This includes manual, tactical fire direction, fire planning and control of radars.

All movement is cross country. Except for the rare improved main supply routes (MSRs), which may support more than a corps, movement is at best on unimproved dirt roads. Field

Artillery units must operate cross country, closely following their supported maneuver units.

In offensive operations, direct support battalions (and reinforcing units) must be included in the brigade task force formation immediately behind the lead task forces. Maneuver units are limiting their rates of movement to allow their supporting artillery to keep up rather than quickly outranging their fire support. The limiting factor, even for a force equipped with M1/M2 tanks, is the cross-country speed of a loaded M548 ammunition carrier (12 kilometers per hour) or M109 howitzer (20 kilometers per hour).

Consolidation—Moving, Resupplying, Massing. Given the reduced threat capability to acquire firing units, the increased threat from small, bypassed units and the overstressed ammunition/fuel resupply system, our batteries are operating as single units instead of platoons.

When batteries move, their formations take two basic forms:

(1) "Battery wedge" formations consist of an M577 command post carrier as the lead vehicle with platoons in echelon to either side. The second M577 and the battery trains follow in the center of the wedge.

(2) Alternately, units move with platoon wedges "in column." Platoon wedges have an M577 as the lead vehicle and two sections to either side to form the wedge. Platoons of a battery are separated by 200 to 400 meters in column with the battery trains following the trailing wedge.

In a battalion move, the unit forms a "battalion diamond." Firing batteries lead in echelon to the flanks. The battalion headquarters and combat trains comprise the trailing point of the diamond.

These formations offer several advantages, given a somewhat reduced threat and the vast distances that units must move.

Control of units during movement is simplified. Moving over long distances with somewhat erratic map accuracy, the reduced number of moving elements and their proximity eliminates many of the problems of "lost" units.

The smaller battalion formation can be tucked tightly behind or in the middle of a brigade formation during movement. This can help the maneuver units gauge their movement rates and provide better security for all the battalion elements.



Sgt. Raymond Roman

Logistics is simplified. With fewer elements to service, ammunition and fuel sections are more able to manage their assets. Operating as a single battery, firing units can also free additional personnel and vehicles (e.g., platoon leader and gunnery sergeant) to help with ammunition convoys. Battalion formations simplify recovery operations and simplify establishment of maintenance collection points.

Battery firing elements simplify massing fires. Given the hasty nature of occupations in an offensive or fluid situation, fewer elements have to be massed. In the wedge formations, tubes can be arranged to reduce the impact of muzzle velocity variations (MVs). This allows the battery to shoot "base piece data" and achieve an effective sheaf without individual piece corrections or waiting to emplace wire communications and gun display units (GDUs). Fire commands are distributed using AN/PRC-127 hand-held radios.

Survey. With the enhanced survey capability provided by an additional survey device per battalion—one global positioning system (GPS)-8/9—for a total of two position and azimuth determining systems (PADS) and one GPS, each battery can provide almost immediate positional survey and rapidly emplace directional control. The nature of the terrain often allows line of sight between batteries to allow for common directional control. Emplacement times have been significantly reduced with first rounds downrange in 10 minutes (hasty occupation from the move, position and directional control—not a hipshoot).

RSOP. In the terrain here, reconnaissance, selection and occupation of position (RSOP) carries a different expectation. There are few if any "great" firing positions, but there are adequate positions everywhere. The number one priority for reconnaissance is the route. Because of the sand and wadis that don't appear on maps, finding a route that gets you to your next operating area is much more difficult and important than where the battery center will be.

Almost all occupations will be "hasty"—from the move. Rapid occupations and displacements are required to allow artillery units to keep up with a moving, fluid fight. Emphasis is on rapidly achieving the ability to fire and mass, then with minimum delay, resuming movement. Position improvement

may be limited to establishing alternate aiming points and methods of lay and ammunition resupply.

MLRS. Our multiple launch rocket system (MLRS) batteries are experimenting with tighter platoon formations and, possibly, battery formations similar to the cannon battalions for movement. These formations allow us to maximize the capabilities of launchers to rapidly disperse, emplace and fire while providing enhanced protection from "leaking" or bypassed forces.

Logistics. Maintenance and resupply over extended lines of communications (LOCs) and in a fluid situation become much more difficult. Mobile operations extend Class III (petroleum, oil and lubricants) distribution to the limit. While ammunition requirements may be reduced during movement, resupply must be accomplished over extended distances and unsecure LOCs.

A significant portion of a unit's ammunition haul capacity is diverted to carry rations and water. Minimum requirements are for three days' rations and five days' water. In a firing battery, this may equate to all eight of the ammunition trailers or one heavy expanded-mobility tactical truck (HEMTT) per battery.

Recommendation. Battalions should operate under the control of a division artillery, to rehearse the dual command and control/logistical links. Stateside division artilleries should train in a National Training Center (NTC), Fort Irwin, California, environment to experience the requirements of integrating target acquisition radars, military intelligence sensor acquisitions, aviation units and reinforcing fires with a divisional scheme of maneuver.

Conclusion

These ideas are the preliminary results of our training and analysis. They're a compilation from many sources and units. As we prove and test these techniques, we'll continue to keep the Field Artillery community abreast of the results.

Redlegs of the 1st Battalion, 3d Field Artillery (First Gunners) and A Battery, 92d Field Artillery (Brave Cannons) of the 2d Armored Division, and the 1st Battalion, 82d Field Artillery (Dragons); 3d Battalion, 82d Field Artillery (Red Dragons); A Battery, 21st Field Artillery (Steel Rain); A Battery, 333d Field Artillery (Triple Threat) and Headquarters and Headquarters Battery of the 1st Cavalry Division Artillery (Red Team) send their greetings from Saudi Arabia.

Red Team, First Team!



Colonel James M. Gass has commanded the 1st Cavalry Division Artillery (home station, Fort Hood, Texas) since June 1989. He also commanded the 2d Battalion, 41st Field Artillery, 3d Infantry Division in Germany, and B Battery, 2d Battalion, 2d Field Artillery, 214th Field Artillery Brigade, Fort Sill, Oklahoma. Colonel Gass had two tours in Vietnam, one as a helicopter pilot in the 25th Infantry Division (Light) and one in the Aerial Field Artillery Battery (Cobra gunships) in the 101st Airborne Division (Air Assault), the latter unit he helped to form. He's a graduate of the United States Army War College, Carlisle Barracks, Pennsylvania, and holds a master's degree from Oklahoma State University.

APPENDIX C



C2 in a **Heavy Brigade**

Movement to Contact

Colonel Randolph W. House, US Army, and
Captain Gregory L. Johnson, US Army

In December 1990, on the eve of Desert Storm, Military Review received the following article from the commander of a heavy brigade deployed and training in Saudi Arabia for the combat operations that appeared imminent. We delayed publishing the article, to see if the "brigade wedge" formation would actually prove its worth in combat. This article describes how the brigade wedge was developed and trained in the desert before Desert Storm and the authors' postscript tells of its effective use in the long-distance movements to contact and attacks that typified the brigade's combat actions in Desert Storm.

The 2d Brigade, 1st Cavalry Division deployed to Saudi Arabia on Operation Desert Shield and closed on its desert tactical assembly area in early October, 1990. The brigade's first priority was to ensure that 100 percent of its soldiers and equipment arrived safely in desert assembly/life support areas and that units could function normally from them. After two weeks in country, the focus shifted completely to war-fighting. Tough, realistic training to maintain our combat readiness was the goal. The brigade developed contingency plans from which full-up orders processes, terrain walks and table briefs, a command post exercise (CPX) and a command field exercise (CFX) were conducted. The brigade CFX provided a means to practice command and control of the brigade in a wedge formation moving quickly over great distances.

As a combined arms maneuver battalion brigade, 2d Brigade is permanently task organized with one balanced task force (two tank companies and two mechanized infantry companies) and two tank-heavy task forces (three tank companies and one mechanized infantry company). The brigade's main command post (CP) and tactical command posts (TACs) are outfitted with the Standard Integrated Command Post System (SICPS), Single-Channel Ground and Airborne Radio System (SINCGARS), maneuver control system (MCS) and mobile subscriber equipment (MSE). These CPs are configured in accordance with standard CP guidelines published by Fort Leavenworth.

As in other heavy brigades in the US Army, 2d Brigade commanders and staff have a wide range of combat training center (CTC) maneuver experience from the National Training Center (NTC), Fort Irwin, California, the Combat Maneuver Training Center (CMTTC), Hohenfels, Germany, several REFORGER exercises, and large-scale exercises at Fort Hood, Texas. However, in this CFX, the brigade battle task force (TF) was required to quickly travel across rugged desert terrain with no road network. A distance exceeding the widest boundaries at the NTC was covered by a full brigade formation in one morning. Under these conditions, systems

were stressed and lessons learned in a way not previously experienced.

Our present doctrine and force structure was developed primarily for a European scenario. Changes in basic doctrine and force structure

A distance exceeding the widest boundaries at the NTC was covered by a full brigade formation in one morning.

Under these conditions, systems were stressed and lessons learned in a way not previously experienced.

will undoubtedly occur as a result of Desert Shield and Desert Storm experiences, but the brigade had to make some adjustments in the desert as it prepared for Desert Storm. This article will describe how the brigade developed the concept and trained for employment in a brigade wedge formation for movement to contact in the expanse of desert terrain.

Our present doctrine allows for flexibility in tactics, techniques and procedures. Full advantage of this flexibility had to be utilized to meet the challenges presented by the vast stretches of desert terrain. For the movement to contact CFX, the brigade battle TF task organized as outlined in figure 1.

One of the main training objectives of the CFX was to test the concept of the brigade wedge. The wedge consists of three maneuver battalion TFs, one artillery battalion, an engineer company and an air defense artillery battery. Brigade planners had templated this wedge formation down to company and battery level and found it to be 9 kilometers wide by 7 kilometers deep (discounting the three TF scout platoons, which move 4 to 7 kilometers forward). We tested this wedge formation during the CFX by taking Global Positioning System (GPS) readings during the battle and later plotting them on a 1:50,000 map and comparing it to our "doctrinal" template (see fig. 2).

We determined that the wedge is an excellent means of maintaining control at all levels while

maneuvering a brigade battle TF over long distances in desert terrain. It allows the commander to keep the force postured for rapid application

The wedge consists of three maneuver battalion TFs, one artillery battalion, an engineer company and an air defense artillery battery. Brigade planners had templated this wedge formation down to company and battery level and found it to be 9 kilometers wide by 7 kilometers deep.

of combat power at the critical point on the battlefield. The brigade zone was 17 kilometers wide on the CFX and was divided into three equal battalion TF zones. The brigade wedge is only 9 kilometers wide with all elements keying on the lead TF. Maneuver units found they did not need wider TF boundaries except to assign forward screen boundaries for the scouts.

This formation was found to be excellent for a force-oriented objective. The brigade commander can order the lead TF to alter its direc-

tion according to the situation, and the rest of the brigade battle TF can easily follow its lead without detailed explanation. It also provides the brigade commander with the option of executing a small number of brigade "plays." The flank TFs can quickly and easily swing left or right, or come to the support of the lead TF.

The brigade commander can mass his forces at the critical point and time with a minimum of confusion. The formation also provides a flexible, on-order company-size brigade reserve from either the left or right wing TF.

Even though the M1/M2/M3 (Abrams main battle tank and Bradley infantry and scout fighting vehicles) fleet can move across the rugged desert floor at high rates of speed, the brigade could only move at a sustained speed of 15 kilometers per hour (kph). Command post tracked vehicles (M577s) proved to be the weak link. The brigade's other tracked vehicles (M113 armored personnel carriers, M901 improved TOW vehicles, M109 155mm self-propelled howitzers, field artillery ammunition support vehicles, fire support team vehicles, combat engineer vehicles [CEVs] and armored vehicle launched bridges [AVLBs]) were all able to move

BRIGADE CONTROL

Improved Tow Vehicle (ITV) Company
from the Balanced TF

Ground Surveillance Radar (GSR) Platoon
Combat Observation Lasing Team (COLT) from
Headquarters, Headquarters Battery (HHB),
Direct Support (DS) Field Artillery (FA) Battalion

FA Battalion (155mm SP) (DS)

Avenger Platoon from HHB, Air Defense Artillery
(ADA) Battalion

ADA Battery

2 Stinger Teams

2 Forward Area Alerting Radars (FAARs)

Engineer Company

Chemical Reconnaissance Platoon
(Decontamination) (DS)

Military Police (MP) Platoon (DS)

Two MSE Signal Sections, (Small Extension
NODE) (DS)

Forward Support Battalion (FSB) (DS)

2 Stinger Teams

BALANCED TASK FORCE (TF) (-)

2 Tank Companies

2 Mechanized Infantry Companies

Vulcan Platoon (+)

4 Stinger Teams

Chemical Reconnaissance Section (FOX)

TANK-HEAVY TF

3 Tank Companies

1 Mechanized Infantry Company

Vulcan Platoon (+)

3 Stinger Teams

TANK-HEAVY TF

Vulcan Platoon (+)

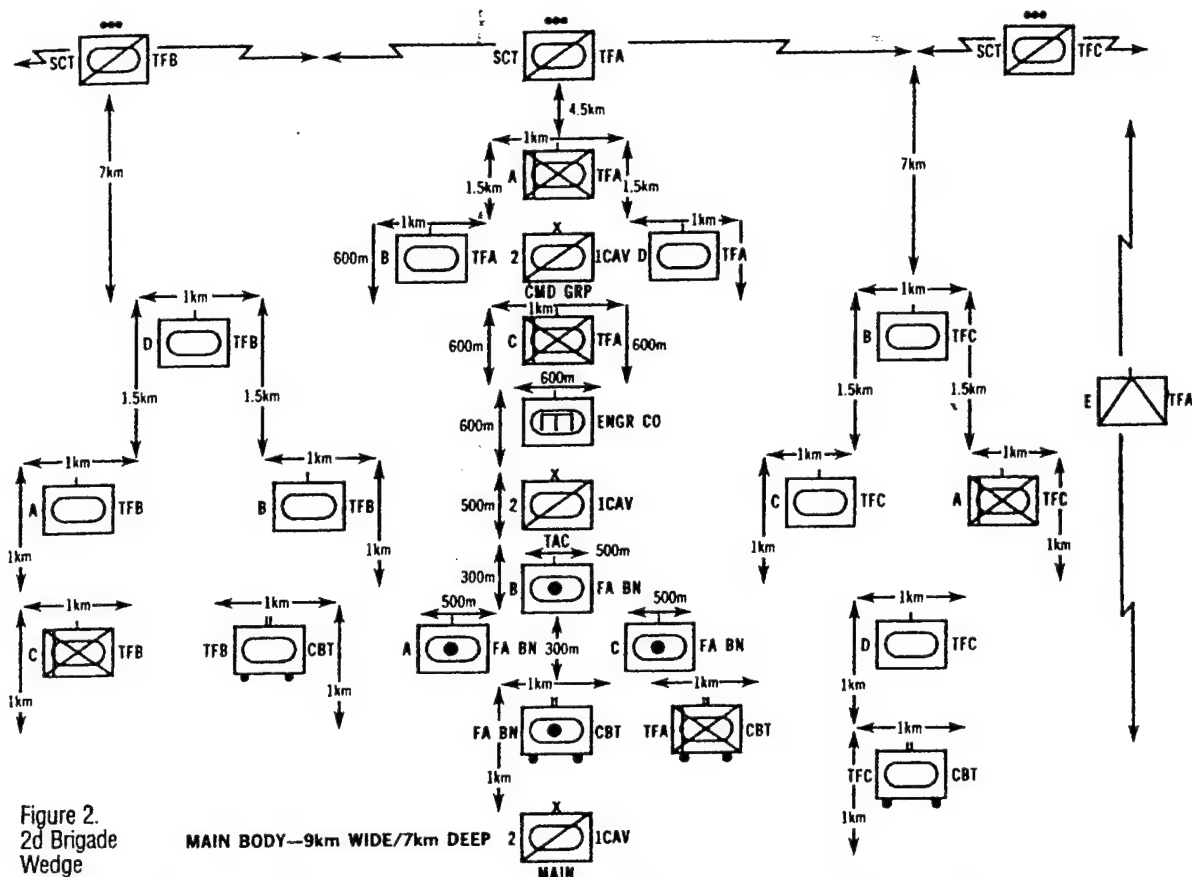
4 Stinger Teams

Other Participants in Brigade CFX

Attack Helicopter Battalion to support Joint Air
Attack Team (JAAT)

Electronic Warfare Liaison Officer (EW LNO)
and communications jammers

Figure 1.



faster than 15 kph and did not hamper momentum. At faster sustained speed, both the battalion TF and brigade formations became more difficult to control and the critical M577 vehicles began to fall behind. The rear of the brigade wedge did experience some "accordion effect," but this was mainly a result of traversing intermittent "go and slow-go" terrain.

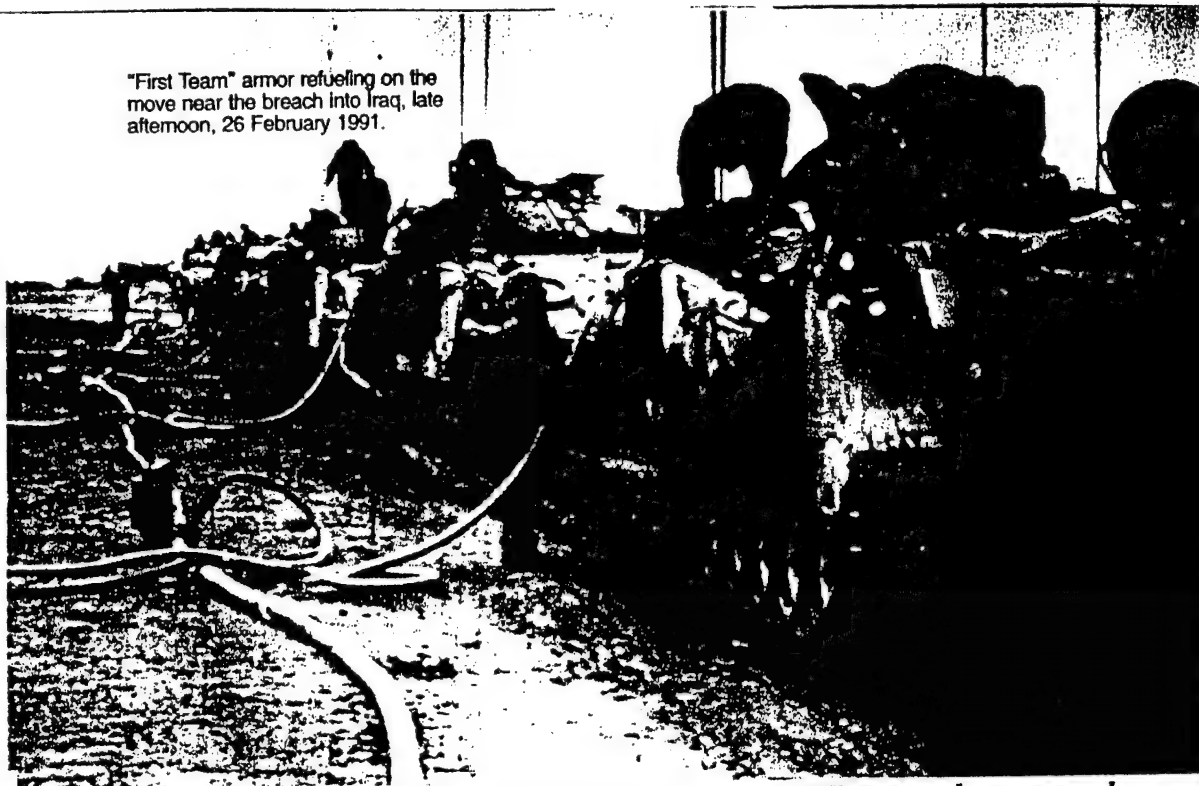
One of the tenets of the brigade wedge formation is the artillery remaining tightly tucked behind the lead TF during the movement to contact. When the brigade commander so orders, it can quickly stop and mass its fires; it always remains within range of the fight. The concept is to keep the artillery moving and only use its fires for the big fight. Were the direct support (DS) artillery to stop and fire at lesser targets during the movement to contact, it would fall behind and not be available at the critical time. The artillery firing batteries had no problem keeping up with the brigade wedge, but had to be moved forward of the lead TF

combat trains to ensure range coverage.

The brigade wedge facilitates maximum command and control from brigade to platoon level. TF commanders had developed three or four TF-level "plays" that were practiced in the weeks prior to the CFX. When executed from the brigade wedge formation, these maneuver plays were relatively easy to control. Spatial relationships between elements of the entire brigade battle TF are easily understood all the way down to individual track commanders. Reaction time is decreased and battle drill or execution of TF plays is facilitated at all levels. It becomes second nature to react as rehearsed to expected threats, and is much easier to react correctly to unexpected enemy activity.

The brigade commander's workable options are increased significantly, without his having to worry about whether the artillery can support a flank swing maneuver, or that the trail TF is too far to the rear to get into the battle. Time and distance factors are known at all levels and each

"First Team" armor refueling on the move near the breach into Iraq, late afternoon, 26 February 1991.



It is doubtful if HEMTTs organic to maneuver TFs can make two round trips a day from the BSA or FAST at these attack distances. . . . The BSA must be able to move forward on short notice. The lack of secure nets compounds command and control problems in the brigade rear areas. Routine maintenance or administrative/logistics traffic can compromise an entire brigade's operation.

and all elements can keep up.

Using the antitank company (improved TOW vehicle-equipped) as a brigade flank screen worked well. On order, they moved immediately to the flank and entered the brigade command net. They were to sustain the screen with the brigade wedge traveling at 15 kph. The brigade commander was able to relay instructions through the flank TF to maintain communications with the screen force when they were in communications dead space.

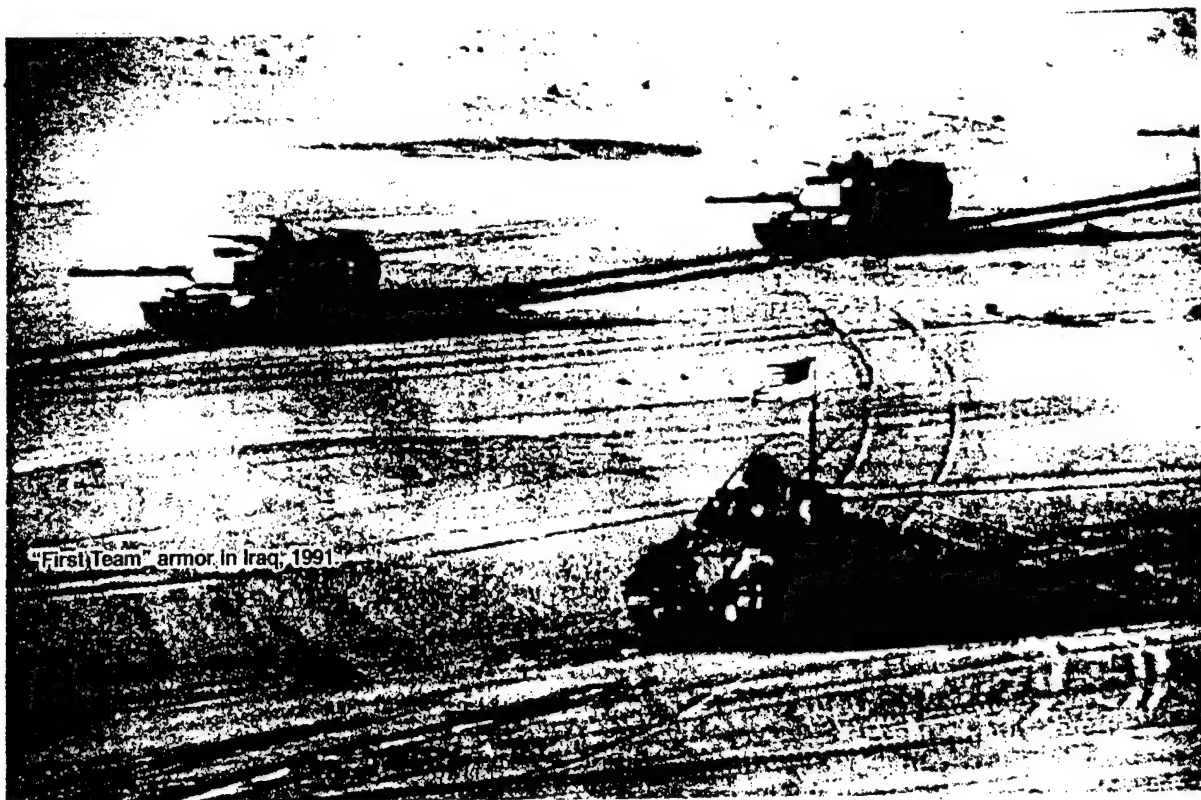
Keeping the engineer company intact and under brigade control also proved to be a good idea. The engineer company moved well and kept up easily. It moves directly behind the lead TF and in front of the artillery, where it can be brought forward immediately for breaching operations or quickly displaced left or right as the situation dictates.

The brigade wedge facilitates good communications within the formation. SINCGARS radios on single channel have been especially reli-

able. Battalion TF commanders were extremely responsive and never lost communications with the brigade commander.

The movement of node centers and remote radio access units (RAUs) forward to cover the movement to contact zone is an important and extremely difficult operation. Commanders and staff rely more heavily on MSE communications. It is a critical asset, especially during planning phases. Like MSE, MCS enhances command and control during stationary planning phases or in operations where CPs are set for extended periods. But a long-distance rapid movement must still be controlled primarily by FM radio.

The most important lesson learned during the CFX was the difficulty of the brigade main CP and brigade TAC in keeping up with the battle as it progresses over long distances. New command and control schemes are being devised at all levels in order for command posts to accomplish their required function of providing critical intelligence information and combat multiplier



"First Team" armor in Iraq, 1991

This formation was found to be excellent for a force-oriented objective. The brigade commander can order the lead TF to alter its direction according to the situation, and the rest of the brigade battle TF can easily follow its lead without detailed explanation. It also provides the brigade commander with the option of executing a small number of brigade "plays."

synchronizaton.

During previous NTC rotations and field exercises, the brigade CPs performed extremely well and had no trouble staying in the battle. Battle hand off between CPs was smooth and jump times (time needed for relocation of a CP) were fast. Communications (SINCGARS, MSE, MCS and retransmission operations) generally worked well at the NTC with one of the brigade CPs always in control of the battle. Therefore, prior to the CFX, it was thought that we just needed to fine-tune a few things concerning CP operations to be as well trained as we could ever hope to be. With this in mind, the brigade planned and executed the November CPX in the Saudi desert.

One of our main training objectives on the November desert CPX had been to critically analyze CP load plans and decide what actually would be carried from the life-support areas into battle. Streamlining was the goal, and one we thought we had already achieved. However, we

discovered that our CPs were still traveling too heavily loaded. As important as certain items of equipment may seem in stationary planning situations, they can severely limit movement speed and operations on the move.

The TAC operations (S3) M577 must be configured to facilitate operations on the move as part of the brigade wedge. This is difficult due to the large map boards required for brigade-level desert offensive operations and the amount of food, water, personal equipment, camouflage nets and other supplies that must be carried on the same vehicle. Inside the M577, a map board covers the entire right side from ceiling to floor. The left side of the track is filled with four SINCGARS radios and the MCS computer. There is no storage space inside the track, so load plans have been revised, leaving out such items as tables, chairs, briefing boards, external map boards and any other "luxury" items that were formerly set up in accordance with the Standard Integrated Command Post System.

Two battle captains (one each from the brigade S3 and S2 sections) sit on a coffin seat inside the track and monitor four nets—brigade and division command nets and brigade and division operations and intelligence (O & I) nets. They are in position to update the map board

The most important lesson learned during the CFX was the difficulty of the brigade main CP and brigade TAC in keeping up with the battle as it progresses over long distances. New command and control schemes are being devised at all levels in order for command posts to accomplish their required function of providing critical intelligence information and combat multiplier synchronizaton.

and can coordinate with each other via the internal intercom through their CVCs (combat vehicle crewman helmets). Being effective at this while moving over rough terrain at 15 kph requires a well-trained crew. If the operations M577 is disabled, the two battle captains can immediately jump to the equally equipped S2 section's M577, which follows as part of the TAC.

The only other vehicles with the TAC are the two high mobility multipurpose wheeled vehicles (HMMWVs) that belong to the brigade commander and the brigade fire support coordinator (FSCoord). The brigade commander, FSCoord and Air Force liaison officer (ALO) are forward in the command group, traveling in two M113A3s. This TAC configuration allows the TAC to operate on the move and keep up with the wedge. It assists the brigade commander in fighting the battle and feeds him information from the brigade and division O & I nets.

It would be ideal to have the brigade main CP stationary while the TAC is moving within the brigade wedge. It had always been brigade SOP for one of the CPs to be set and in control of the battle while the other displaces forward. This is a sensible procedure and should be practiced

when distances allow. The brigade main CP, with its five M577s, extensive communications capabilities and large staff is a tremendous asset in fighting the current battle and planning for the next one. It is limited, however, by the fact that it must be stationary and located within communications range of the brigade command group, TAC, maneuver TFs and artillery. However, in a scenario where the brigade travels 60 kilometers in 4 hours on a movement to contact, bounding the main CP and TAC, with one always set, will not work. They cannot keep up.

It appears that the best solution is for the main CP to cross the line of departure (LD) behind the brigade wedge and move at the same time as the TAC. The brigade main CP continues to move behind the brigade wedge until contact appears likely. It would then go to ground (set up) at a distance of 9 to 15 kilometers from the likely point of contact (or when expected contact occurs). With one FM retransmission station dropped off at the appropriate location by the TAC, the main CP could stretch its internal control forward to a range of approximately 33 kilometers. The main CP must also execute a retransmission scheme as it moves forward, dropping retransmission elements at locations that best facilitate communications back to the division main CP. Once the brigade main CP is set, MCS, MSE and AM radio assets can be more fully integrated. The brigade TAC would continue to move forward to around 3 to 5 kilometers from enemy contact and control the direct fire battle. The command group moves to the critical point on the battlefield and the brigade commander commands from there. If contact does not develop, movement of the two CPs continues.

At the division level, where CPs are larger, the same kind of command and control problems exist in long movements to contact. For instance, the division main CP's expandable vans will be difficult to move across this type of terrain. The division TAC is as big as the brigade main CP and will have the same kind of problems. The division forward command group has to be as far forward as possible, but is still tied to the combat multiplier assets controlled through



M-109 self-propelled howitzers moving through Iraq

One of the tenets of the brigade wedge formation is the artillery remaining tightly tucked behind the lead TF during the movement to contact. When the brigade commander so orders, they can quickly stop and mass their fires; they always remain within range of the fight.

the TAC or main CPs. This is a formidable problem that still requires workable solutions.

The brigade rear CP moves forward with the FSB (forward support battalion) main body. Doctrinally, one of the missions of the brigade rear CP is to assume control of the battle if both the main CP and TAC lose control. This is perhaps an unrealistic expectation in this situation. The rear CP is too far behind to assume effective control of the current battle. That mission could be better accomplished by a designated TF commander and his TOC.

The FSB used the forward area support team (FAST) concept to support forward as soon as the enemy situation permitted. This enables critical support assets to deploy forward rapidly without being tied to a large brigade support area (BSA) move. This shortening of supply lines is critical on long-distance operations. The FAST established ambulance exchange points (AXPs), ammunition transfer points, unit maintenance collection points and Class III (POL [petroleum, oil and lubricants]) resupply points as far forward as permitted by the enemy situation.

The establishment of the forward link with the brigade, while maintaining the rearward link with DISCOM (division support command), is a difficult but critical mission. The FSB moves slowly and has an extremely difficult time linking up after a long attack, due to the preponder-

ance of non-HMMWV/non-HEMTT (heavy expanded mobility tactical truck) vehicles. The majority of the FSB consists of conventional trucks that are "road bound" and unable to traverse desert terrain. They are a hindrance in a movement to contact and can jeopardize the operation. Routes must be meticulously planned to facilitate responsive support.

Experienced leaders must accompany support truck movements. Although the requirement is real, it is doubtful if HEMTTs organic to maneuver TFs can make two round trips a day from the BSA or FAST at these attack distances. Similar to the CP problem, the BSA must not become entrenched at its last location. The BSA must be able to move forward on short notice. The lack of secure nets compounds command and control problems in the brigade rear areas. Routine maintenance or administrative/logistics traffic can compromise an entire brigade's operation.

The FSB will probably move the medical company forward to the LD (line of departure) after the brigade wedge has crossed. This alleviates part of what is a serious medical evacuation problem during attacks covering large distances. Pushing AXPs as far forward as possible from the medical company to points behind the brigade wedge shortens the distance from battalion TF aid stations to the AXP. As with logistical lines, if medical evacuation lines are stretched too thin,

attack momentum can be halted. Medical evacuation helicopters in this environment will most likely go no further than the AXPs. Thus, the system that takes a wounded soldier from a front-line location to the battalion aid station, AXP, medical company and beyond is critical to not

Two battle captains (one each from the brigade S3 and S2 sections) sit on a coffin seat inside the track and monitor four nets. . . . They are in position to update the map board and can coordinate with each other via the internal intercom through their CV helmets. Being effective at this while moving over rough terrain at 15 kph requires a well-trained crew.

only soldier survival, but ultimately to command and control and the momentum of the attack.

The CFX movement to contact zone had no roads, rough terrain and several areas of loose sand. M1A1 Abrams tanks get less fuel mileage in this environment than technical manuals indicate. M1A1s can go about 200 kilometers on a 500 gallon tank of fuel, M2s about 300 kilometers on a 175 gallon tank of fuel, and M113A3s about 300 kilometers on a 96 gallon tank of fuel. It is critical that all vehicles cross the LD topped-off with full fuel tanks. FSB and internal refuel on the move operations have become the norm.

The brigade has learned a tremendous number of lessons about maneuver warfare during its time in the desert. We drill it, teach it, talk it, and ponder its application in this environment on a daily basis. We are rethinking some of the ways we do business in the heavy forces, and are in the process of reworking battle staff and tactical SOPs. This is not a complete relearning of all valuable NTC lessons, but a thought process that involves the intelligent application of tactics, techniques and procedures to a new and demanding theater of operations.

Postscript

This article was originally completed on 20 December 1990, shortly after the close of the brigade CFX, and submitted to *Military Review* that week. From that time until the end of the war, the brigade continued to refine the concept of the brigade wedge. The use of this technique turned out to be the most important command and control asset and combat multiplier of the war for 2d Brigade. It facilitated rapid movement over great distances, instant and easily executed responses to fragmentary orders issued on the move, and the precise placement of combat power at the critical time and place. The brigade made extensive use of the wedge, moving hundreds of kilometers in a variety of combat operations. As a postscript of the prewar submission, the following brief description of how the brigade wedge was actually used by 2d Brigade during *Desert Storm* is offered.

The brigade wedge was used for the first time by the entire brigade battle TF in January when the brigade moved north to occupy border defensive positions. The brigade TF, in the wedge formation, moved 65 kilometers in 4 hours in what turned out to be the final practice of this formation before its use in combat. It worked extremely well in this move, just as it had in the December CFX.

With the aid of GPS navigational devices, the wedge was able to change directions several times after only one radio transmission from the brigade commander to the lead TF commander. Everyone on the command net acknowledged the change; those not on the command net simply continued to guide on the lead TF. There was no problem with individual or groups of vehicles separating from the formation. Every vehicle crewman knew the formation diagram and understood the spatial relationship of his platoon, company and TF.

The only change made to the brigade wedge as a result of this first movement of the entire brigade was shifting the engineer company to the rear of the formation behind the artillery battalion. The old M-60 chassis engineer vehicles (CEV and AVLB) could keep up, but the com-

pany tended to stretch out so much behind the lead TF that the artillery battalion could not range out to the forward scouts. This change puts the brigade TAC immediately behind the lead TF. The field artillery battalion follows 100 meters behind the brigade TAC, putting it in excellent position to provide fire support for the entire brigade battle TF. The engineer company remains close enough to respond quickly to any of the three battalion TFs.

The brigade wedge was used in attacks up the Wadi AL Batin as part of the theater deception plan, and on the long flanking movement west and exploitation deep into Iraq. The attack formation wedge was able to maintain its intended nine by seven kilometer dimension, expanding and contracting as necessary, while moving hundreds of kilometers at 20 kph. Throughout these operations, everyone was extremely confident that this formation was the SOP solution to the command and control challenges of the requirement to move brigade and division combat formations extremely long distances on little or no notice. It simplified operations to the point where reactions to unexpected situations and response to fragmentary orders from the brigade commander were automatic. By providing a starting base, the wedge became the key to the TF and company/team battle drills that were used.

During the attack and exploitation against the Republican Guards in Iraq, objectives often shifted by as much as 40 to 50 kilometers. These changes were often received while the brigade was on the move toward a previously defined objective. Because of the flexibility of the wedge formation and the brigade's training and confidence in using it, these shifts in direction were deftly accomplished. One radio transmission from the brigade commander and the entire brigade battle TF executed changes on the move.

The possibility of fratricide was greatly dimin-

Doctrinally, one of the missions of the brigade rear CP is to assume control of the battle if both the main CP and TAC lose control. This is perhaps an unrealistic expectation in this situation. The rear CP is too far behind to assume effective control of the current battle. That mission could be better accomplished by a designated TF commander and his TOC.

ished by moving and fighting from the wedge. When the brigade arrived at one of its later objectives, the division had run up directly behind (within 1 kilometer) another division that was engaged in a fight with the Medinah Division of the Republican Guard Forces Command. Spot reports of activity to the brigade's front were pouring into CPs at all levels. Disciplined, well-trained soldiers and units were immediately informed and control was maintained by a completely intact C² system, after a 300 kilometer, extremely rapid attack. The tight control in the brigade wedge formation was a key ingredient in preventing fratricide.

The wedge also provided a readily formed defensive formation when movement stopped. Navigation was enhanced considerably. Breaking maneuver elements out of the wedge to execute a series of well rehearsed plays in an attack or in reaction to enemy fire was a key component in the use of this formation. After executing these maneuvers from the wedge, reassembling and continuing movement in the wedge was accomplished almost effortlessly. In hindsight, no better formation could have been used in accomplishing the myriad of combat missions over the distances and terrain encountered in Desert Storm. **MR**

Colonel Randolph W. House is the commander of the 2d Brigade, 1st Cavalry Division, Fort Hood, Texas. A graduate of Texas A&M University, he has served as an infantry company commander; commander, 1st Battalion, 61st Infantry; G3 of the 5th Infantry Division (Mechanized); and executive assistant to the Joint Staff.

Captain Gregory L. Johnson is the S3 plans officer for 2d Brigade, 1st Cavalry Division, Fort Hood, Texas. A graduate of the US Military Academy, he has served in three mechanized infantry battalions and was a company commander in 1st Battalion, 16th Infantry, 1st Infantry Division (Forward).

APPENDIX D

Movement-to-Contact

"Red Dragons" in Operation Desert Shield



Line of Departure Time 0600—The 2d Brigade (Blackjack), 1st Cavalry Division, crosses the line in a movement-to-contact with three task forces abreast in a brigade wedge formation. Expected enemy heavy contact is 80 kilometers away.

The brigade moves out on time at a very calculated 10 miles per hour. The speed, dictated by the brigade commander, enables all combat systems and key combat service support vehicles in the brigade battle task force to keep in

formation. The 3-82 FA Red Dragons, the brigade's DS [direct support] artillery battalion, moves tucked behind the brigade's combat vehicles.

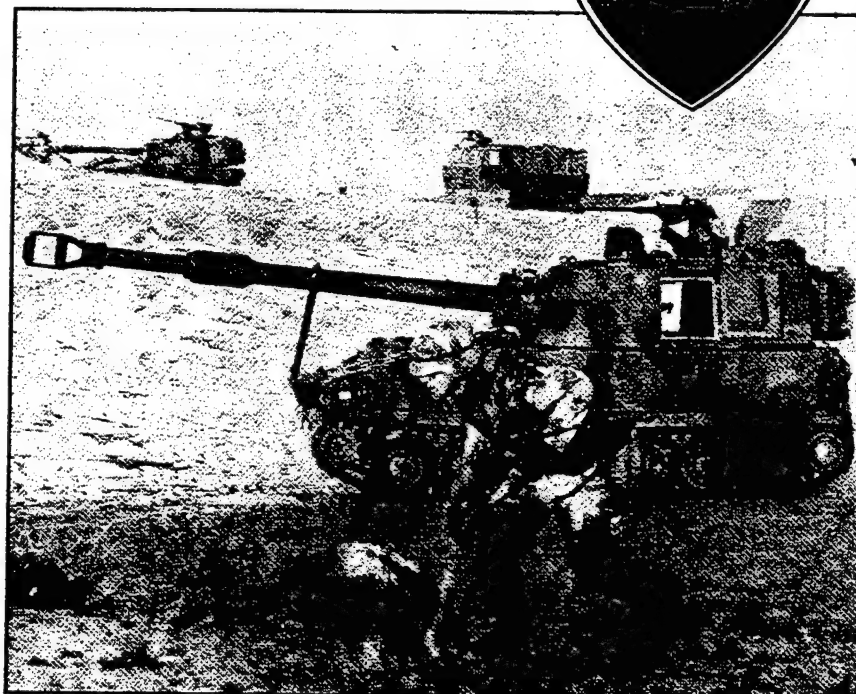
An hour later, brigade scouts suddenly report contact with

an enemy screening force. The brigade continues to move as the situation develops. The screening force becomes what appears to be a battalion-sized security force.

The brigade comes to a halt as the commander orders a task force to maneuver on the enemy force. The FSCOORD [fire support coordinator], collocated with the brigade commander in his M113, orders the Red Dragons to halt immediately and occupy firing positions.

"Red Dog, Red Dog, azimuth of fire 6200" goes out simultaneously over the battalion command net and voice fire net. Every key leader in the battalion knows the battalion is stopping to fire. In less than 10 minutes, all firing batteries are occupied on common direction and are massing accurate, predicted fires on an enemy tank battalion.

If necessity is the mother of invention, then Saudi Arabia is the place with the



by Lieutenant Colonel Kenneth R. Knight and Captains Henry S. Larsen, Allen W. Batschelet and Ronald A. Hoskinson

This article was written before the beginning of the Desert Storm ground war by the battalion and three battery commanders in the 3d Battalion, 82d Field Artillery (3-82 FA), 1st Cavalry Division, who developed the battery wedge formation concept for artillery movement in Operation Desert Storm. The 3-82 FA Red Dragons were deployed in Saudi Arabia from early October 1990 through Desert Storm.

"needs." For the 3-82 FA, the mission is unchanged—provide DS artillery fires in support of an armored brigade. What has changed are the parameters the battalion operates under. Those have, in turn, caused us to alter our methods of fire support, including occupation of posi-

tions using the global positioning system (GPS) or the position and azimuth determining system (PADS).

The firing battery commanders were given these parameters:

1. Move directly behind the maneuver battalions in a movement-to-contact

scenario. Be prepared to occupy and fire on contact.

2. Move with platoons in wedges, battery in column (see Figure 1). Sustain a rate of speed of 10 miles per hour over long distances. Be able to sprint short distances at 20 miles per hour.

3. For command and control purposes, occupy as a battery and be prepared to deliver accurate, predicted fires in less than 10 minutes. Included in this time is safety verification and establishing survey control.

4. Batteries A and C each had a PADS vehicle attached. B Battery had a survey team equipped with the GPS AN/VSN-8.

Movement

A brief note on navigating in Saudi Arabia: the majority of the area is rolling sand dunes without the wadis found at the National Training Center (NTC), Fort Irwin, California. The few terrain features usually aren't on the map.

the one exception to this are man-made features. The way to navigate is by measuring distance and direction.

To help navigate, battery commanders have a long-range aid to navigation (LORAN) device. This off-the-shelf item is an excellent navigational aid that gives longitude and latitude to a location and also provides direction and distance to the next location of travel. Using the LORAN, the Red Dragons determined longitude and latitude for templates used to quickly obtain a six-digit grid reading from a military map. But the LORAN doesn't have the degree of accuracy needed to shoot artillery.

The batteries caught on quickly to moving in wedge formations. The fire direction officers (FDOs) in the M577 fire direction center (FDC) tracks controlled their platoon wedges using standard hand and arm signals, flags and AN/PRC-127 radios. The battery commander controlled the battery formation

and issued directional guidance to the lead FDC, as needed. The second platoon followed in the first platoon's tracks, minimizing vehicle risk if it encountered a minefield.

Because of the need to move at 10 to 15 miles per hour, the M577 couldn't tow a trailer in soft sand. The M577s averaged 15 miles per hour maximum speed with trailer and 20 miles per hour without trailer in soft sand. This caused the FDC sections to cross-level their combat loads with the howitzer sections in their platoon. The FDCs' B-Bags and a majority of their food and water were stored throughout the platoons.

The Red Dragons brought the M332 ammunition trailers to Saudi Arabia, which can be towed behind an FA ammunition support vehicle (FAASV) at rates of 25 to 30 miles per hour. The M332 ammunition trailer hauled the three-day supply of water and rations and 50 percent of the section's cots, a necessity in the desert.

The soft sand also caused the tracked vehicles to lose some of the fuel range they usually had on hard surfaces. In the sand, they get about two-thirds of their listed vehicle range. The formation consisted entirely of tracked vehicles and high-mobility multipurpose wheeled vehicles (HMMWVs).

The battery maintenance contact team had an M578 recovery vehicle and a HMMWV. Prescribed load lists (PLL) were cross-leveled on the FAASVs, and locator cards told the motor sergeant where to find parts, such as gun radiators and fan towers.

The battery first sergeant controlled the battery trains, which were consolidated at the battalion level under the senior firing battery first sergeant. Because of the M35 2 1/2-ton truck's extremely poor performance in the soft sand, the battery trains had to link up with the battery using the road network and contact points.

The 3-82 FA innovations began primarily with the battery occupation.

Occupation with GPS

When the maneuver forces made enemy contact, the batteries received orders from the brigade fire support coordinator (FSCOORD) or battalion S3 to occupy immediately (see Figure 2). Unlike hipshoots at home station, there's no better location or terrain for immediate occupation than the Saudi

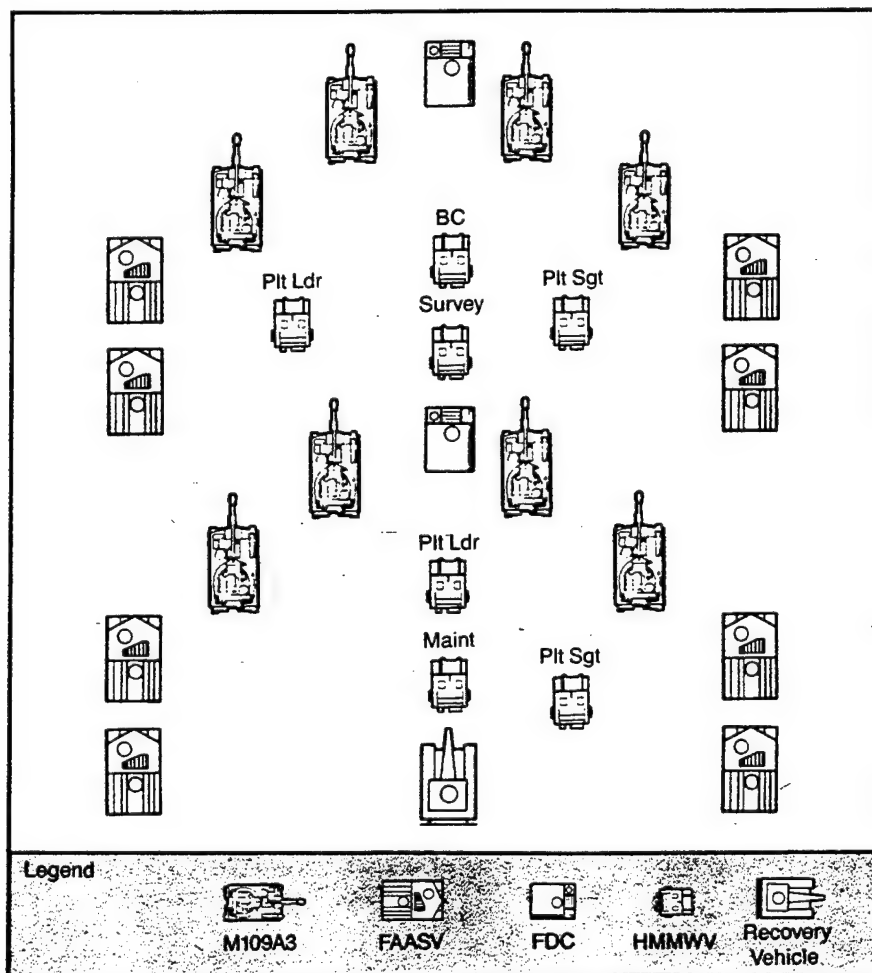


Figure 1: Movement in Wedge Formation. The platoons moved in wedges with the battery in column, all tucked behind the maneuver brigade's combat vehicles.

desert—the terrain is the same for miles. The platoons occupied positions 150 to 200 meters apart in their wedge formations with the trail platoon behind the lead platoon along the azimuth of fire.

As shown in Figure 2, the two gunnery sergeants, first platoon leader and battery commander moved to the left side of the formation, centered between platoons. The first platoon gunnery sergeant set up aiming circle #1 magnetically and laid the second aiming circle (#2). At the same time, the second platoon leader, FDOs and platoon sergeants guided the guns into position with M2 compasses. The FDCs swung to opposite sides of the battery.

A "hot loop" was run from gun to gun with guns 4 and 8 running wire to the lay circles. The two lay circles then laid their platoons using PRC-127s as the primary means of communication and the hot loop as a secondary means. Howitzers were easily identified by 8-inch luminous numbers painted on the inside of the gunner's door, which were visible during occupations.

The first platoon leader set up and magnetically oriented the safety circle over the orienting station (ORSTA) grid established by the GPS. The safety circle bumped with lay circle #1 and conducted a simultaneous observation (SIMO) with the battalion's master station or either A or C Batteries—GPS doesn't provide an accurate azimuth to the end of orienting line (EOL). For the SIMO, the battery commander's driver acted as radiotelephone operator (RTO) while the platoon leader's driver marked the EOL.

Once the SIMO was complete, the battery commander compared the survey azimuth to the magnetic azimuth and adjusted the azimuth in the battery computer system (BCS), using the right add, left subtract (RALS) method. The battery wasn't relaid. The safety circle was marked with a green flag to enable gunners to easily identify it. The survey team, using GPS, determined the battery center and data to one of the guns to be used as the adjusting piece.

Immediately after being laid, each gun obtained a referred deflection to the safety circle and sent a runner to the safety circle to get checked out as safe. This procedure reduced transmissions over the radio and wire nets and cut down the total ready-to-fire time significantly.

Each platoon leader or his platoon sergeant monitored the gun line to ensure

a smooth occupation. The battery commander gave both FDC representatives ORSTA location data, data to battery center and adjusted azimuth of fire and then designated the hot FDC that would control the battery. The FDCs reported READY:X with the battery center to the tactical fire direction system (TACFIRE) at battalion and computed the base-piece gun data and average battery muzzle velocities before the battery was laid and safe.

During night occupations, the three circles each were marked with three unique colored lights. Each platoon's howitzer sections also had their own unique color to identify the section.

Because one platoon FDC controlled the battery during fire missions, the "cold" FDC monitored the platoon's ammunition count and tracked the fire missions. The cold platoon FDC could immediately pick up control of the battery if the hot FDC had any problems.

Occupations with PADS

The two firing batteries with PADS occupied in the same manner with the exception of determining common direction. When an occupation was ordered,

PADS established an ORSTA where the safety circle was positioned and an EOL at the battery center.

The battery was laid by the lay circles that were set up in the same manner as mentioned previously. The safety circle bumped with the lay circle and followed the lay of the battery, recording the referred deflections to each piece. The safety circle compared the magnetic lay azimuth with the survey data from PADS, and the azimuth of fire was adjusted (again using the RALS formula) and given to both FDCs for input into the BCS and backup computer system (BUCS).

Both the GPS and PADS occupation procedures were tested during live fire at ranges in Saudi Arabia. These procedures for occupying as a battery take between six to nine minutes to get accurate, predicted fire down range, including conducting the SIMO. Good effects on target and battery sheafs have been reported by the observers at various gun-to-target ranges and charges.

Conclusions

Before artillery purists expound on advance party, individual gun data and 3x8

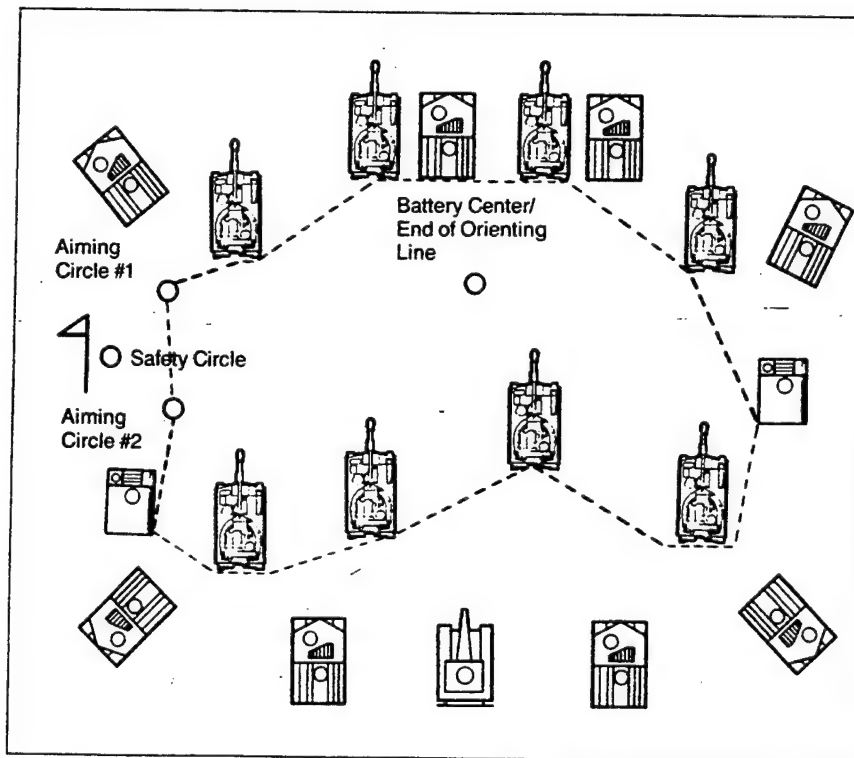


Figure 2: Movement-to-Contact Occupation. When the brigade makes enemy contact, the batteries occupy positions immediately. The platoons occupy 150 to 200 meters apart in their wedge formations with the trail platoon behind the lead platoon along the azimuth of fire.

platoon concepts, remember the parameters of the mission. During a movement-to-contact with firing batteries immediately behind the maneuver forces, if we had used advance parties, they would have been in soft-skinned vehicles positioned with M1A1 Abrams tanks and M2 Bradley infantry fighting vehicles. Their survivability would have been doubtful, and the firing platoons would have been in their area before they could have completed any substantial preparations. Pre-planned firing positions were almost impossible to determine over the estimated long distances.

Getting individual gun data is important and is something to strive for when time is available to get subtense and vertical interval to each piece. Then you enter this information into the BCS, compute terrain gun position corrections (TGPCs) and wait for the gun display units (GDUs) to tie in with the FDCs. We followed these steps if the battery remained in position long enough.

The platoon-based portion of 3x8 doctrine has its place in many scenarios. But the battery wedge formation increased

our responsiveness to the maneuver elements and positioned the battery's senior officer in the critical place to command and control his unit during the fluid movement-to-contact mission.

The mission, enemy, terrain, troops and time available (METT-T) our battalion faced in Operation Desert Shield dictated the parameters under which we operated. Operation Just Cause in Panama, December 1990, called for different operational parameters. And, perhaps, a future contingency someplace else in the world will call for yet another set of parameters.

Regardless, Field Artillerymen must be technically and tactically competent and *flexible* to provide lethal, accurate fires—on time, anywhere their mission takes them.



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Captain Henry S. (Skip) Larsen commands B Battery, 3d Battalion, 82d Field Artillery. He previously served in direct support battalions in the 4th and 8th Infantry (Mechanized) Divisions, Fort Carson, Colorado, and Germany, respectively. Captain Larsen is a graduate of the Infantry Officer Advanced Course, Fort Benning, Georgia, and the Combined Arms and Services Staff School, Fort Leavenworth, Kansas.

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APPENDIX E

How to Cure the FIST-V Blues

by First Lieutenants Aaron L. Geduldig, Mark S. Kremer, James A. Skelton and Willie R. Witherspoon

Do you have the M981 fire support team vehicle (FIST-V) blues? Bring in that old M981 and drive away in a new Bradley fire support vehicle or FM2. The new FM2 has greater mobility, speed and armament and allows quicker fire mission time. This isn't the fire support vehicle of the future. The FM2 is available now and is the most advanced fire support vehicle on the modern battlefield. This concept is combat tested and proven during Operation Desert Storm—it works. The soldiers who employed it in battle designed this vehicle.

While deployed as part of Operation Desert Shield, FISTs in M981s conducted numerous training exercises with their maneuver units. The current FIST vehicle wasn't doing the job in offensive operations. It had problems with mobility, speed and fire mission times. The smaller engine and track caused the M981 to bog down in the soft sand, and initializing the north-seeking gyro (NSG) increased the time required to process the fire missions.

As the training for war continued, the need for fire support increased. The conventional FIST-V provided a means of fire support, but an improved system was available. With the "rollover" of all M2 Bradley fighting vehicles in the 1st Cavalry Division in December, we had the opportunity to try a FIST-Bradley concept.

M2 Conversion to FM2

The battalion command sergeant major, a group of fire support soldiers, the direct support (DS) contact team and communications specialists went to work. They drafted a plan to allow some of the old Bradleys to stay in the hands of the artillery for testing purposes.

With one Bradley as a prototype, the group transferred the communications system from the FIST-V to the Bradley. But the Bradley only had a two-radio capability for the infantry, and four are required for a FIST. The two radios in the turret of the vehicle remained in place, and the communications team mounted two more in the hull. The team also mounted the FIST digital message device (DMD) in the hull (see Figure 1). This configuration allowed the DMD operator easy access to the two radios in the hull and the DMD. The two men in the turret had easy access to the radios they needed to monitor.

The next step was to mount the ground/vehicular laser locator designator (G/VLLD) on the M2. With the help of the maintenance team, a bracket was designed that would easily mount it on the right front of the turret (see Figure 2). The only temporary glitch in mounting the G/VLLD was running the DMD interface cable to the DMD in the hull. The slip ring in the bottom of the turret was the first option. This didn't work because of the turret's 360-degree traverse capabilities. The communications team reviewed the Bradley schematics and devised a way to run the cable through the communications system by using dead-

pins in the communications boxes. This option successfully interfaced the DMD and G/VLLD and worked flawlessly.

Our battalion commander, (3d Battalion, 82d Field Artillery), the 1st Cavalry Division Artillery commander, 2d Brigade commander and, eventually, the division commander reviewed the prototype. They approved our retaining one per task force for the lead company and one for our brigade's combat observation laser team (COLT). Each team converted its M2 to an FM2, generally a two-day process.

There are several other ways to convert the Bradley into a FIST Bradley. The tube-launched, optically-controlled, wire-guided (TOW) rack can house the G/VLLD. The teams discussed this option, but determined it wasn't feasible with limited time and resources. Another location for the G/VLLD is in the coaxial machinegun slot; it'll fit in this position. From either position, the team can boresight the G/VLLD with the main gun sight. Also, the team can use the Bradley thermal night sight, a better system than the G/VLLD night sight (TAS-4B). Our putting the G/VLLD in front of the Bradley commander's hatch is a method that works effectively but isn't the only solution.

Operational Questions

The FIST Bradley raised many questions. Where was maintenance support going to come from? Would the FIST Bradley change FIST tactics? What about self defense? Do we need the 25-mm gun? How were the FIST teams going to determine accurate target locations without the NSG?

Maintenance. The maintenance support had an easy solution. Each maneuver company had hull and turret mechanics that knew the system—as opposed to

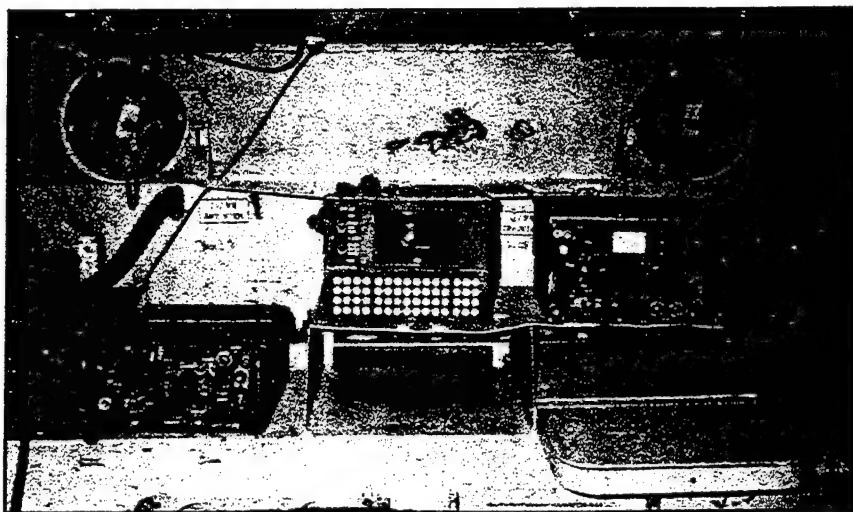


Figure 1: The team mounted the FIST DMD and two radios in the Bradley's hull.



Figure 2: Using a specially designed bracket, the team mounted the G/VLLD on the right front of the M2's turret.

having the FIST-V in a Bradley or tank company without knowledgeable mechanics. The maneuver company mechanics fixed most problems on the spot. Our team drivers studied the operators manual and learned the system quickly. The Bradley needs preventive maintenance each day; done correctly, it performs exceptionally well.

✓ **FIST Tactics.** The question of employing the FIST Bradley was a little harder. Teams have always moved about the battlefield and gotten into the best position to call for and observe rounds. Each team realized the importance of fire support and chose not to change its employment strategy because of its different vehicle. The ability to move about the battlefield increased, and teams found they could gain better vantage points from which to do their jobs.

The greatest advantage of the FIST Bradley's staying in the maneuver perimeter is its ability to blend in with the other Bradleys. The FIST no longer had a G/VLLD hammerhead and four antennas telling the enemy who and where it was; the FIST Bradley looks like any other Bradley. The teams devised a way to hide the two extra antennas by using the Bradley's gun portholes. Antenna tie-downs ran inside of the vehicle where the DMD operator could raise or lower them. When the particular radio (for example, the digital net) wasn't in use, the operator pulled the antenna down. This method, along with the likeness of vehicles, provided additional "camouflage" not possible with the M981.

Self Defense. The M60 machinegun on the M981 is a good weapon for self defense. Many argue that this is all the

FIST needs while in the company perimeter. Although this is true, the 25-mm gun, with a 7.62 coaxial machinegun, provides the same defense with added bonuses. FISTs now can shoot direct and indirect fires simultaneously. When the need for fire support becomes greater, the team must maneuver into the best position to call for fire, possibly exposing itself. With the FIST Bradley, we can better defend ourselves while doing that.

One of the most debated issues has to do with the 25-mm main gun. Some artillerymen felt the FIST would lose perspective by having this weapon system and "fight" instead of call for fires. This wasn't the case. Only the brigade COLT used its main gun as a means of suppressing the enemy while continuing its mission. The ranging data from the G/VLLD determines distance for the 25-mm gun, providing an accurate means of direct fire while also calling for artillery.

As our brigade COLT discovered in combat, the maneuver unit may not always be able to support you while you're supporting them with artillery. The COLT needed to return direct fire while trying to withdraw to another observation location. The FIST Bradley allowed the COLT to return fire at a greater range and with more killing power, thus facilitating its withdrawal and subsequent observation of its fire missions. The M981 doesn't have the firepower we need.

Self-Location for Targeting. The M981 FIST-V has the NSG, which helps locate targets. It takes from eight to 10 minutes to initialize and align it. In addition, the FIST must get into a position on the battlefield where it can raise the hammerhead. As all teams discovered, there isn't time to stop, raise the hammerhead, initialize and align in an offensive battle. By the time these tasks are complete, the enemy has located your position. Also, the maneuver unit doesn't have time to stop and wait for this process.

The FIST Bradley doesn't have an NSG. But, the FM2 is more effective than the FIST-V and warrants some type of self-locating device. Throughout Operation Desert Storm, each team used either the long-range aid to navigation (LORAN) device or the global positioning system (GPS). The LORAN works off radio towers, the GPS works satellites.

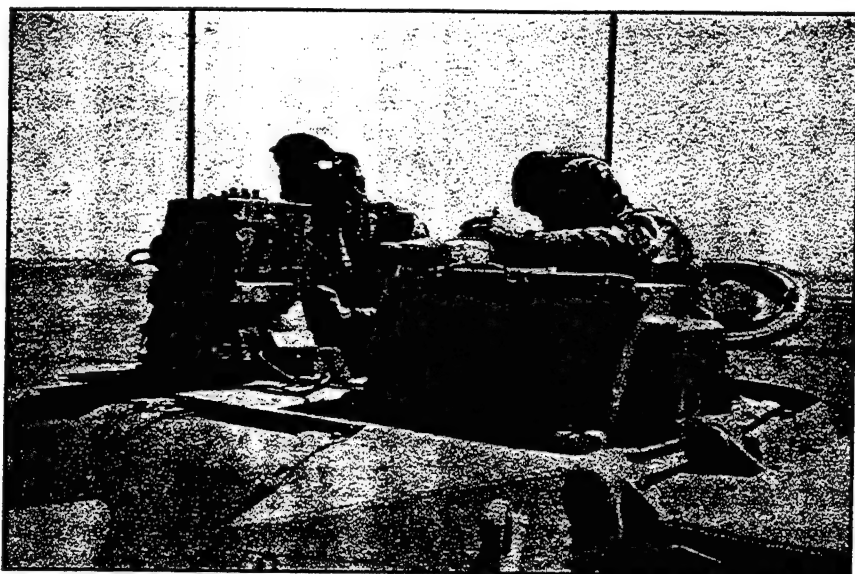


Figure 3: The M2's two-man turret allows an additional set of eyes on the battlefield, one of several advantages the FIST Bradley has over the FIST-V.

There are two methods for locating targets that work best when using the FIST Bradley. One is to set the GPS to the azimuth tracking mode in mils. The GPS will continually update your azimuth and location as you maneuver. When the observer discovers the enemy, the G/VLLD operator uses the azimuth adjusting knob to set the proper mil reading from the GPS. The other man in the turret tells the DMD operator the GPS grid location (observer), using the DMD's observer-location (OBCO) file. When this is complete, the G/VLLD operator lases the target, directly sending it to the DMD operator. This method is quick, easy and provides accurate target location.

The second method is a little slower but also very accurate. The G/VLLD operator locates a distant aiming point, and the other man shoots an azimuth with a compass. The azimuth is shot from in the turret or from directly in front of the vehicle. From inside the vehicle, you use either a non-magnetic compass or compensate for the magnetic attraction by using the adjusting screw on the M-2 compass. This method works effectively. Both methods provide a much quicker mission response time than using the NSG on the current FIST-V and provide extremely accurate fires.

Even without a navigational device, the Bradley is still a better FIST vehicle. You still have the G/VLLD, and you can shoot an azimuth in the same manner as mentioned. The difference is your ability to determine your own location, a key to accurate, predicted fires. Of course,

map reading is always available. But many times you may not have the map sheet of the area you're operating in. If the map is available, you can be just as accurate.

The need for some type of navigational aid exists whether you're in a FIST-V or FIST Bradley. Having the aid in the FIST Bradley cuts mission time significantly.

FM2 Advantages. There are several advantages the FIST Bradley has over the M981 FIST-V. First, the two-man turret allows an additional set of eyes on the battlefield (see Figure 3). The lieutenant and the fire support sergeant can see the whole battlefield. The driver provides an additional set of eyes, giving the team three observers. This allows one man to track the movement on the map, follow the execution matrix and monitor the task force radio. The second man operates the G/VLLD, monitors the company command net and navigates the vehicle. The DMD operator can monitor another net in the hull of the vehicle while maintaining digital communications. This keeps one man from trying to do too many things simultaneously. Each man on the team works together to achieve accurate, predicted fires.

Secondly, the FIST Bradley can easily maneuver with the supported company. The common complaint among FIST-V-equipped teams is the maneuver unit outruns them. This is no longer a concern, and as mentioned, the Bradley also blends in with the rest of the company.

During Operation Desert Storm, the externally mounted G/VLLD proved

more efficient than the hammerhead. The FM2-equipped teams fired Copperhead rounds where M981 teams didn't have the time to set up. The quicker mission time allowed the FM2 teams to locate the target and lase before the enemy detected them. Several M981 teams transferred the G/VLLD from the hammerhead to the front of their vehicles because of the success with the FM2. This is an obvious advantage as Copperhead is the most lethal tank killer in the artillery inventory.

The quicker mission response time is an obvious advantage. The ability to set up the G/VLLD for action in a short time is an advantage to the FIST and the supported unit. The FIST doesn't have to expose itself with the hammerhead up for extended periods of time, and the maneuver unit gets responsive artillery that can change the course of the battle.

The teams in Saudi Arabia that made the conversion learned the system and its maintenance from their maneuver units and fired gunnery tables with them. We truly became a combined-arms team.

Putting fire support equipment on the FIST Bradleys used in Desert Storm is not the only way to solve the FIST-V blues. But it's one solution soldiers can implement easily before combat. There are options concerning where the G/VLLD can go, how many radios to install and who rides in which position. Regardless, the FM2 remains the most advanced fire support vehicle used in Operation Desert Storm. The FIST Bradley proved its worth in combat.



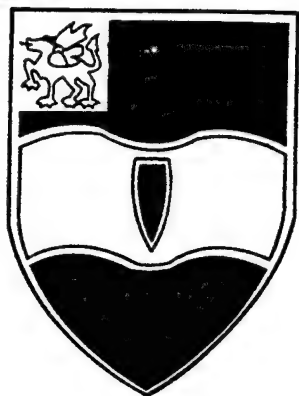
First Lieutenant Aaron L. Geduldig served as Task Force Targeting Officer and Company Fire Support Officer (FSO) for the 3d Battalion, 82d Field Artillery, (3-82 FA) 1st Cavalry Division in Operation Desert Storm. He's currently a Firing Battery Platoon Leader for the 3-82 FA at Fort Hood, Texas.

First Lieutenant Mark S. Kremer was a Company FSO for 3-82 FA in Desert Storm. He's currently a Battery Fire Direction Officer (FDO) in the same battalion.

First Lieutenant James A. Skelton was a Combat Observation Lasing Team (COLT) Leader for 3-82 FA in Desert Storm. Lieutenant Skelton is currently the battalion's Service Battery Executive Officer.

First Lieutenant Willie R. Witherspoon was a Battery FDO and Company FSO for 3-82 FA in Desert Storm. He's now a Platoon Leader for the battalion at Fort Hood.

APPENDIX F



Operation Desert Shield from an FDO's Perspective

by Captain Todd R. Lietha

Preparing for combat in the deserts of Southwest Asia has caused leaders to come to grips with a myriad of new challenges: moving over wide open areas with long-range fields of view...traversing terrain that ranges from loose sand to sharp, jagged rocks...conducting operations with inaccurate or, in some cases, no maps.

The 3d Battalion, 82d Field Artillery (3-82 FA, Red Dragons) the direct support (DS) artillery battalion for the 2d Brigade (Blackjack), 1st Cavalry Division, addressed these challenges as they applied to fire support and providing timely, accurate fires.

From a fire direction officer's (FDO's) perspective, this article discusses methods the 3-82 FA developed to meet two challenges we faced. The first was to provide battalion fire direction in support

of a maneuver brigade conducting a movement-to-contact. The second challenge was to use the tactical fire direction system (TACFIRE) effectively to plan a subsequent battle while fighting the current one.

Fire Direction

A maneuver brigade conducting a movement-to-contact in deserts such as those in Saudi Arabia covers extremely long distances. Commanders frequently discuss distances in the 100- to 200-kilometer range.

The rate of movement must not outrun the brigade's fire support umbrella. The artillery battalion that moves by bounding fire units, or even battalions leapfrogging each other, tightly constrains

the brigade's rate of movement. This constraint is alleviated by keeping all artillery moving until large, decisive targets are identified.

Movement

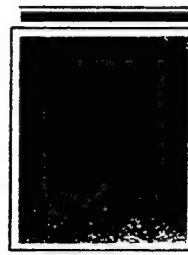
To take advantage of the open terrain, our firing platoons moved in battery wedge formations. The battalion, tucked up behind the lead task force, also moved in a wedge (see Figure 1). The units occupied as batteries, and each had one platoon fire direction center (FDC) control the battery's fires. The other platoon FDC followed the missions and picked up control, if necessary.

While tracked artillery vehicles and high-mobility multipurpose wheeled vehicles (HMMWVs) have little problem maintaining the rate of march, the 2 1/2- and 5-ton trucks (e.g., TACFIRE prime movers) quickly become stuck or fall behind the battle. The 3-82 FA developed a method for providing tactical fire direction when the battalion's TACFIRE system and mutual support unit (MSU) battalion's TACFIRE were left behind.

During a movement-to-contact, the battalion was controlled from a jump tactical operations center (JTOC). The JTOC consisted of three HMMWVs: the battalion S3's, the battalion communications-electronics staff officer's (CESO's) and the battalion's retransmission vehicle (Retrans). The JTOC's personnel were the battalion S3, battalion FDO, CESO, chemical officer (CHEMO) targeting officer, S2 NCO-in-charge (NCOIC) and the vehicle drivers. During Operation Desert Storm, the S3's HMMWV was replaced with a fire support vehicle (FSV).

FDO Tools

To conduct tactical fire control, the battalion FDO carried some very important items. The first was a fire control attack matrix. (See Figure 2 for an unclassified example of an attack matrix, using fictitious values.) This matrix allows the FDO to quickly determine the number of rounds required to engage a



target, based on the commander's attack criteria and target type, size and strength.

TACFIRE develops the matrix by firing missions; therefore, Joint Munitions Effectiveness Manual (JMEM) data is used to derive the values. The attack criteria is set to the appropriate percentage of effects desired, and the target size and ammunition vary as the missions are processed.

Another important item the battalion FDO carried was a modified map board. Due to the length of the battlefield, using a map board with standard map sheets was too cumbersome and time-consuming. Instead, we cut a sheet of 1:25,000 chart paper in half and drew lines to make the scale 1:50,000. We then mounted the gridded sheet on a board and put a piece of plexiglass over it.

Once the battalion stopped, the battalion FDO numbered the grid lines on the map board, writing on the plexiglass with an alcohol marker. When doing this, the FDO considered the fire unit locations and direction of the battle. The battalion S3 maintained a map with the current graphics and forward line of own troops (FLOT).

We kept a range protractor (GTA 6-5-1), commonly called a whiz wheel, with the map board. Additional maximum range marks were made on the range arm for high explosive (HE), dual-purpose improved conventional munitions (DPICM) and Copperhead rounds for green, white and red bag powder charges. The protractor was used to determine the azimuth of fire and check ranges.

The battalion FDO also had a backup computer system (BUCS) with a survey module and the appropriate howitzer modules. We frequently used long-range aid to navigation (LORAN) devices in the Saudi Arabian desert for both self-location and navigation, which is an instrument that expresses locations in latitude and longitude. The battalion FDO used the survey module to convert latitude and longitude to grid. The howitzer modules provided the ability to do technical fire direction, should it become necessary.

Fire unit and ammunition status boards, alcohol markers, records of fire, target lists and other forms were in the BUCS brief case. The FDO also brought TACFIRE printouts of fire plans, the battalion target file, observer file and ammunition sums.

Fire Direction Procedures

Once the brigade commander stopped the artillery to engage targets (with the

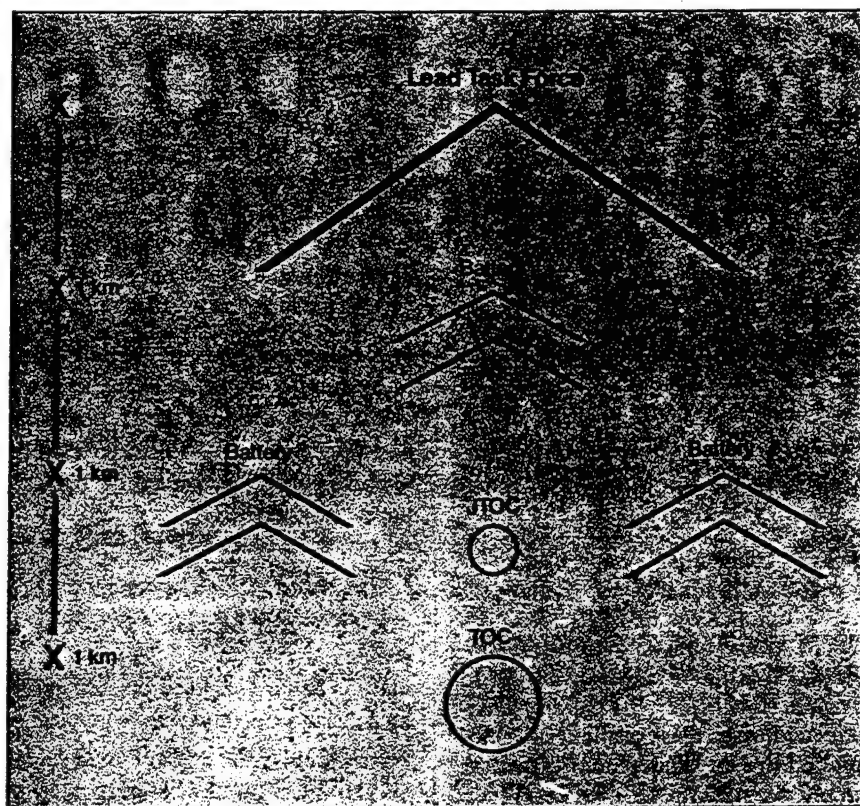


Figure 1. Battalion Wedge Formation. To take advantage of the open terrain, the artillery battalion moves in a wedge formation tucked up behind the lead task force. Within the battalion, the firing platoons also move in battery wedge formations.

advice of the DS battalion commander), the battalion FDO labeled the grid lines on his map board and plotted fire unit and observer locations as they were received. He also updated the FLOT.

A fire mission was called to the FDO over the voice fire net from a task force fire support officer (FSO). All fire units recorded the call-for-fire and began processing the data while the units continued to emplace.

At the same time, the battalion FDO checked the range and determined the unit(s) to fire and type and amount of ammunition to fire; the battalion S3 checked the target location for violation of fire support coordination measures and the FLOT.

If everything checked out, the FDO issued the message-to-observer (MTO). The MTO also served as the battalion fire order. Units assigned to fire by the MTO then acknowledged receipt of the mission.

All this took place in the eight to 10 minutes it took to emplace the battalion.

When possible, the JTOC collocated with a non-controlling platoon FDC. This added two radio nets to the JTOC and a digital link to the division artillery and (or) the other organic fire units. Once the TOC was operational, the JTOC merged with the TOC.

The battalion FDO operated on three nets. The first was the battalion voice fire net where he talked to the DS battalion commander, brigade FSO, task force FSOs and the DS battalion fire unit FDCs. Task force FSOs sent calls-for-fire on this net. The second net was a division artillery voice net for division artillery mass fire missions.

The third net, as applicable, was a voice fire net with a reinforcing battalion. This required the battalion FDO to issue fire orders to the reinforcing battalion and repeat other critical information. If the

reinforcing fire units transmitted over the DS battalion's voice fire net, it added additional radio traffic to an already full net.

Once the battalion's TACFIRE system caught up (if it caught up), fire mission processing was passed back to the digital world.

TACFIRE Planning

Planning for the movement-to-contact as well as planning and executing other types of tactical operations are intensive operations in the TACFIRE shelter. The procedural trap that many have fallen into is to plan, fight, purge and then begin inputting the plan for the next battle.

History shows that in combat, battles have sporadic peaks and valleys of activity. We can't count on having the time to regroup after the "purge" to begin planning the next battle. We can't expect to have the relative breaks between battles like those at the National Training Center (NTC), Fort Irwin, California. Inputting data into TACFIRE for a subsequent battle while fighting the current battle requires a formal, practiced method of naming and using the computer's files.

Fire Plan Categories

The 3-82 FA categorized its fire plans into three types: groups, series and on-call target lists. The on-call target lists included targets from the groups and series.

There's a distinct difference between the targets in an on-call target list and targets in an on-call group or series. On-call targets are fired individually when called for from the target list. Targets in an on-call group or series are fired as scheduled within the group or series, but the execution time (H-Hour) of the group or series is on-call.

The on-call target list was input first. Because the list covered the entire battlefield, it may have needed to be split into more than one fire plan to include all fire units associated with each target. In this case, range-to-target was the determining factor. Once the on-call target list was input, the groups and (or) series were input.

Because the target list was input into on-call target files, the battery computer system (BCS) could receive, store and update target list data. We couldn't have done this using only the battalion target file.

#Rounds/Battalion Volleys									
Target	Size**	10% Effects*		20% Effects		30% Effects		Preferred Shell/Fuze	
		HE/VT	DPICM	HE/VT	DPICM	HE/VT	DPICM		
Armored Medium	100	24/1	24/1	—	24/1	—	24/1	DPICM/TIB	
	200	48/2	48/2	—	48/2	—	48/2		
	300	72/3	72/3	—	72/3	—	72/3		
	400	—	96/4	—	96/4	—	96/4		
Armored Personnel Carrier	100	24/1	24/1	24/1	24/1	24/1	24/1	DPICM/TIB	
	200	48/2	48/2	48/2	48/2	48/2	48/2		
	300	—	72/3	—	72/3	—	72/3		
	400	—	96/4	—	96/4	—	96/4		
Armored Light	100	24/1	24/1	24/1	24/1	24/1	24/1	DPICM/TIB	
	200	48/2	48/2	48/2	48/2	—	48/2		
	300	—	72/3	—	72/3	—	72/3		
	400	—	96/4	—	96/4	—	96/4		
Arty Medium	100	24/1	24/1	24/1	24/1	24/1	24/1	HE/VT	
	200	72/3	72/3	72/3	72/3	72/3	72/3		
	300	—	—	—	—	—	—		
	400	—	—	—	—	—	—		
ADA Missile	100	12/	12/	12/	24/1	24/1	24/1	DPICM/TIB	
	200	24/1	24/1	24/1	48/2	48/2	48/2		
	300	48/2	48/2	48/2	72/3	72/3	72/3		
	400	72/3	72/3	72/3	96/4	96/4	96/4		
Veh Light Wheeled	50	12/	12/	12/	12/	12/	12/	DPICM/TIB	
	100	24/1	24/	24/1	24/1	24/1	24/1		
	200	48/2	48/2	48/2	48/2	48/2	48/2		
	300	72/3	72/3	72/3	72/3	72/3	72/3		
Veh Recon	50	12/	12/	12/	12/	12/	12/	DPICM/TIB	
	100	24/1	24/1	24/1	24/1	24/1	24/1		
	200	48/2	48/2	48/2	48/2	48/2	48/2		
	—	—	—	—	—	—	—		

* The values in this table are for example only. Actual values are computed using JMEMS and are classified.

** TACFIRE and JMEMS use target size instead of strength for determining the number of rounds to engage a target with.

Figure 2. The 3-82 FA Fire Control Attack Matrix. This matrix allows the FDO to quickly determine the number of rounds required to engage a target, based on the commander's attack criteria and target type, size and strength.

Fire Unit Volleys

When inputting a fire plan, it's important to keep in mind the concept of fire unit volleys as it applies to TACFIRE. A fire unit may be a platoon or a battery, depending on how the battalion is operating at the time. This can be determined by looking at an AFU;UPDATE (ammunition and fire unit) to see if a unit is entered as a platoon or a battery. The UNIT field and WPNSTR (weapons strength) field give the best indicators.

It's important to remember a fire unit volley doesn't equal a battalion volley. If the battalion is operating by platoons, it takes *six* fire unit volleys to equal one battalion volley. If the battalion is operating by batteries, it takes *three* fire unit volleys to equal one battalion volley. The required fire unit volleys for a target and the MAXVOL (maximum number of volleys to be fired) set in the computer are two critical items in massing the battalion on a target.

When determining and inputting a future plan into the TACFIRE system, you must consider the number and type of fire units available, the number of rounds required and available, and the timing of the plan's execution (see Figure 3).

Planning Files

To input the plan in TACFIRE, you must create a number of additional files, and file maintenance becomes critical. Once future plans become current, you must purge old plans and data. We used three categories of files to build from:

1. **Default.** These files have preset default values and don't change.
2. **Current.** These files have the data that's currently being used by the computer to do its tactical fire control.
3. **Planning Files.** These files have data applicable to future operations. At the appropriate time, they may become the current files.

In coordination with the battalion FDC, the brigade FSO breaks down the battlefield into segments for AFU planning purposes (see Figure 4). These segments are most easily delineated by phase lines (PLs). The planning segments and file names for NNFP (non-nuclear fire plan), AFU and SPRT (support) planning files are published in the fire support annex of the brigade operations order (OPORD).

The FM;MOD (fire mission; modification) and NNFP;MOD files contain, in addition to other items, the commander's attack criteria and MAXVOLs. In many cases, the criteria and, therefore, the MOD files don't change from one battle to the next. In such cases, you don't input the NNFP planning file.

NNFP planning files are named Z1, Z2, Z3, etc., as needed. You make the NNFP;MOD planning files current when the data they contain becomes applicable.

Using current AFU data when inputting fire plans for a future battle can cause capabilities (e.g., range), ammunition and (or) scheduling exceptions. The battalion FDC inputs one AFU planning file for each planning segment designated by the brigade FSO.

Fire units for each battalion are input at the same grid. This won't effect the actual firing data because the fire units recompute the fire plan based on their locations. Ammunition levels are increased to projected resupply levels.

When building a fire plan, the fire support element (FSE) does its AFU;BUILD (build means create a new file from existing ones) from the AFU planning file for the battlefield segment in which the planned targets are located. AFU planning files are named X1, X2, X3, etc., as needed. You never make AFU planning files current because the fire unit locations and ammunition reports they contain are only projections.

Battlefield geometry for future battles is input into a support planning file. The basic "rule of thumb" for inputting planned geometry is the agency that establishes it inputs it. There's usually only one SPRT planning file per battle, but you may need more, depending on contingency plans.

Some geometry from the current battle may be applicable to the future battle.

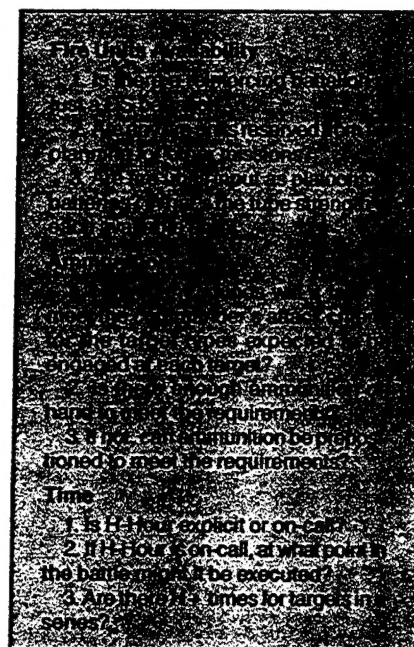


Figure 3: TACFIRE Future Planning. Considerations of the number and types of firing units, the number of rounds needed and available, and the timing of execution are particularly important when inputting future plans in TACFIRE.

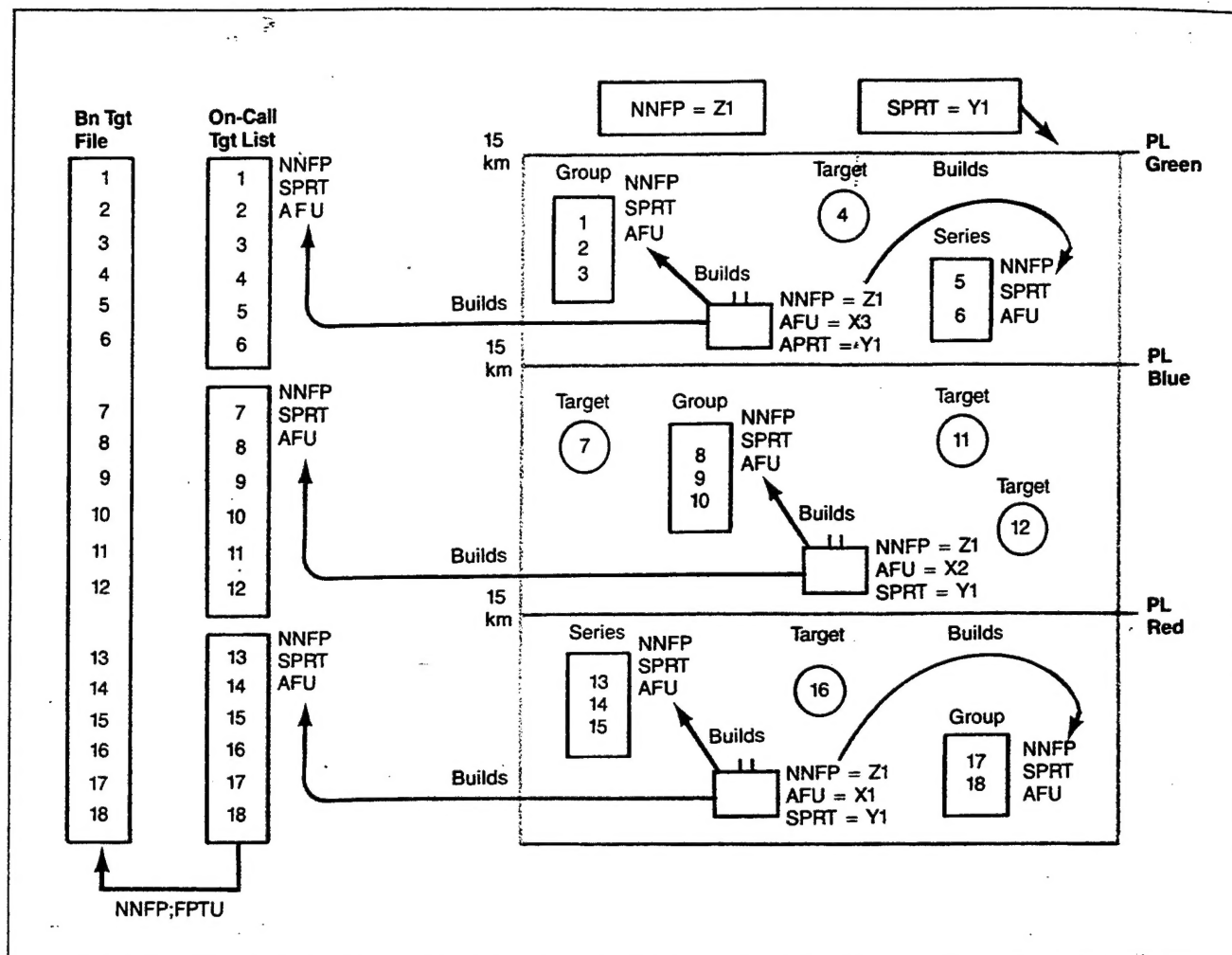


Figure 4. Brigade Battlefield Fire Plans for a Subsequent Battle. In coordination with the battalion FDC, the brigade FSO breaks down the battlefield into segments for AFU planning purposes. The segments are most easily delineated by phase lines (PLs).

Use the SPRT;BUILD format with the following entries to build those particular pieces of geometry into the SPRT planning file:

- **NEWPLAN**—Planning file a piece of geometry is to be brought forward into.
- **NAME**—Name of piece of geometry to be brought forward.
- **ZON** (Zone), **RFA** (Restricted Fire Area), **RFL** (Restricted Fire Line), etc.—Enter X as appropriate.
- **SPRT** planning files are named Y1, Y2, Y3, etc., as needed. You make the SPRT planning file current when the data it contains becomes applicable.

You build the fire plans using standard procedures, inputting on-call target lists first followed by the groups and series. The targets in the on-call target list are entered using the NNFP;FPTU (fire planning target update) format and recorded in the battalion target file. You

then can build groups and series from the targets in the battalion target file.

You name groups and series according to doctrine. But you give on-call target lists unique names. For example, our brigade target lists were BDOC01, BDOC02, etc.; Task Force 1-5 (Mech) target lists were 1-5M01, 1-5M02, etc.

The battalion FDO must discuss these concepts and procedures with the FSEs face-to-face. The most effective method for training these procedures is to have the FSE personnel use the operations and intelligence (O&I) variable format message entry device (VFMED) for a day and input a number of plans. This allows the FDO to make on-the-spot corrections. It also makes answering questions and addressing misunderstandings easier.

The procedures to provide fire direction for a brigade conducting a movement-to-contact and to use TACFIRE to

plan a subsequent battle while fighting one require dedicated training to implement. But once in place, they effectively overcome some of the challenges presented by combat in a large, desert environment.



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